

iOS 7 Tech Talks 2013



San Francisco



New York



Tokyo



Shanghai



Berlin



London

These are confidential sessions—please refrain from streaming, blogging, or taking pictures

Integrating iOS 7 Technologies

Paul Marcos

App Services Evangelist

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These are confidential sessions—please refrain from streaming, blogging, or taking pictures

Push updates

AirDrop from Activity sheet

Add to Reading List

Ranking-style leaderboards

Background asset downloads

Game score signing

3D map view

UIKit Dynamics

Inter-app audio

Map snapshots

Dynamic type size

Sprite Kit

Directions API

Custom video compositors

iBeacon

Authenticated Game Center players

Automatic Configuration



New Core Image filters

Game controllers

Expanded Bluetooth LE profile support

Guided Access API

Multipeer connectivity

60fps video capture

New turn-based game modes

Multitasking

Map tile overlays

Geodesic polylines

Technology advancements
enable experience enhancements

Agenda

Agenda

Background Transfers

Multitasking

iBeacon

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Background Transfers

Multitasking

iBeacon

Agenda

Background Transfers

Multitasking

iBeacon

This item is over 100MB.

Keynote will not download until you
connect to Wi-Fi.

Cancel

OK

Minimizing Install Time

- ☐ Take inventory
- ☐ Use compression
- ☐ Download things later

Take Inventory

Take Inventory

- Open your app bundle in Finder



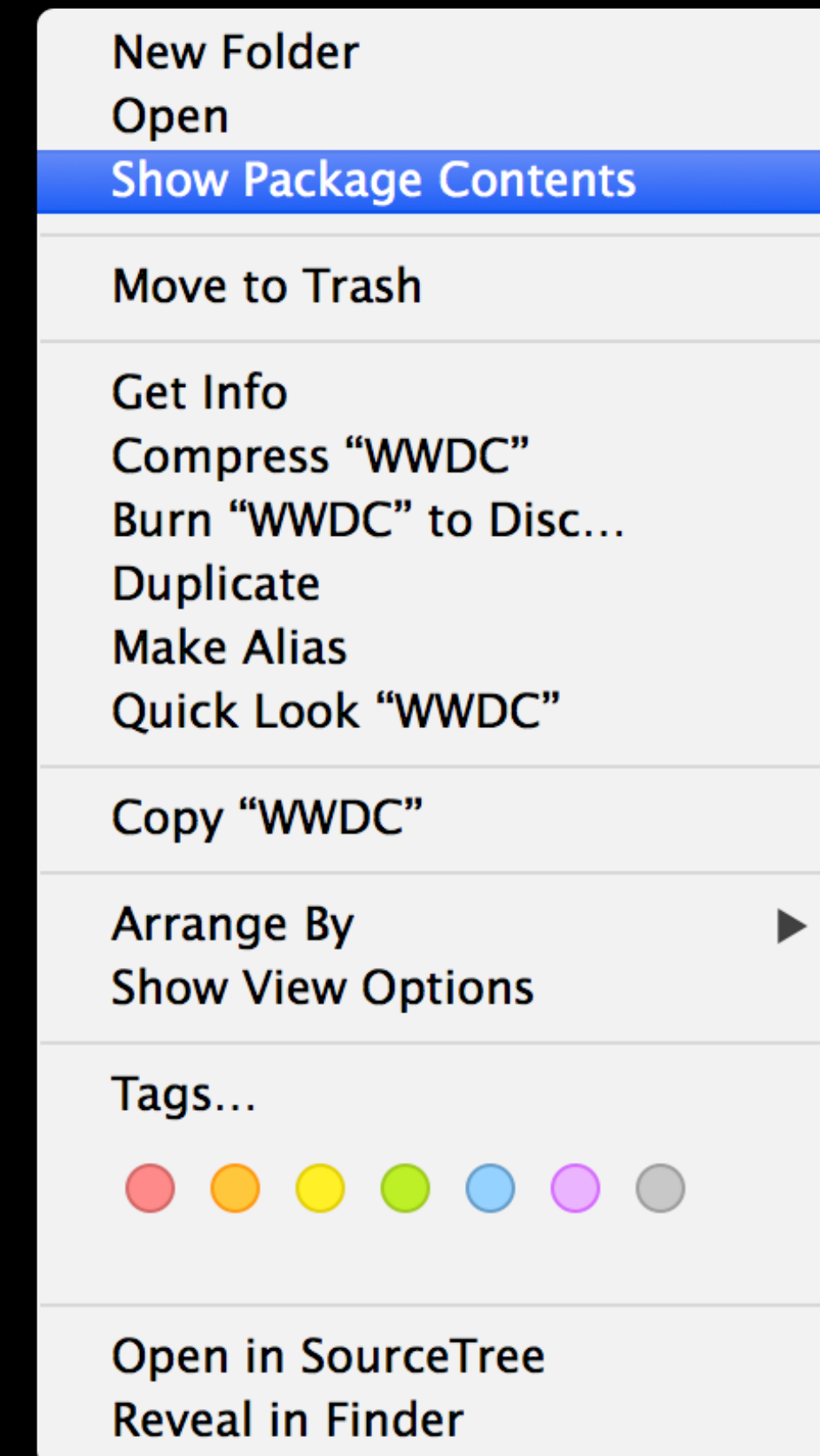
Take Inventory

- Open your app bundle in Finder



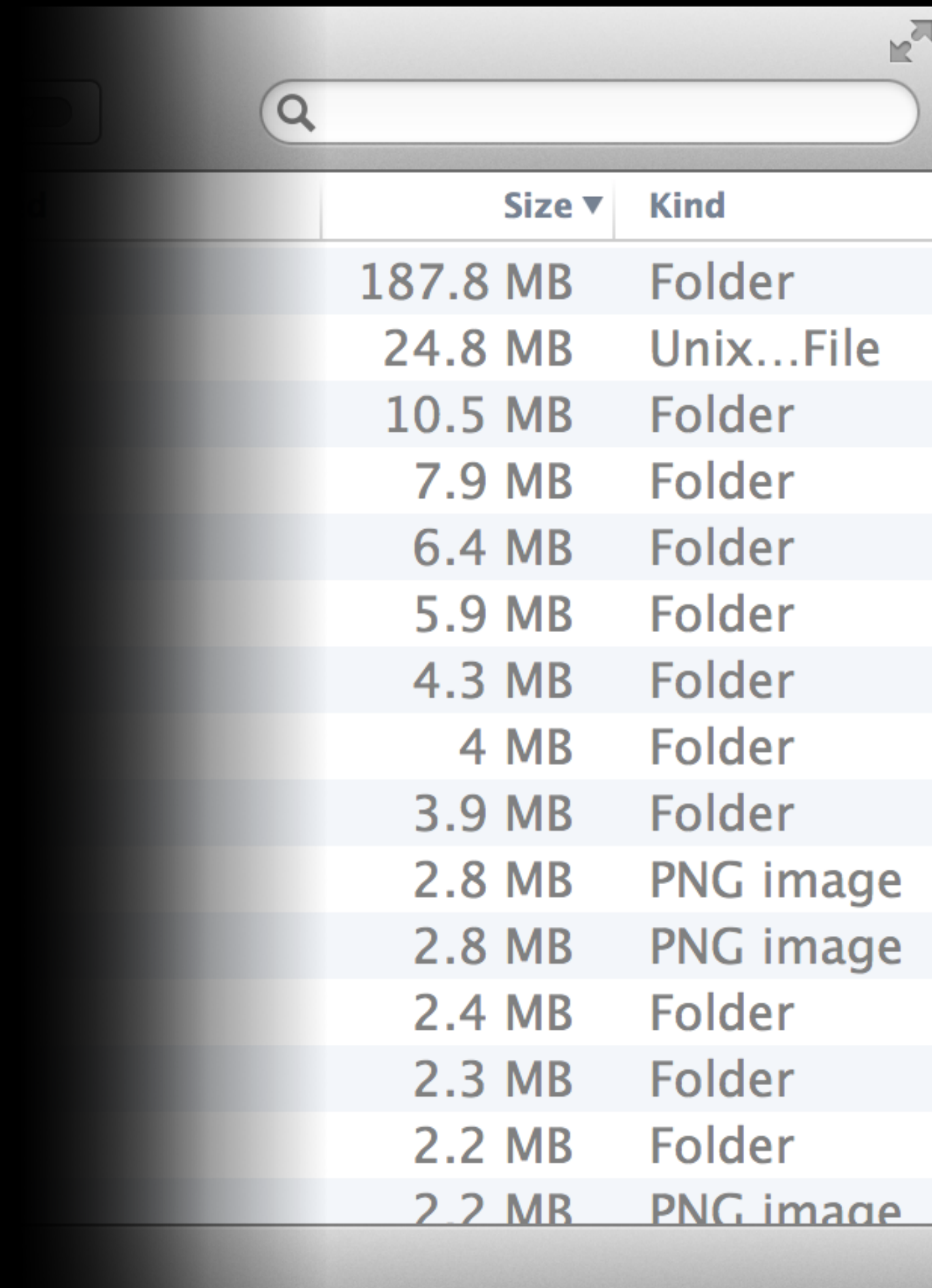
Take Inventory

- Open your app bundle in Finder



Take Inventory

- Open your app bundle in Finder
- Review every file

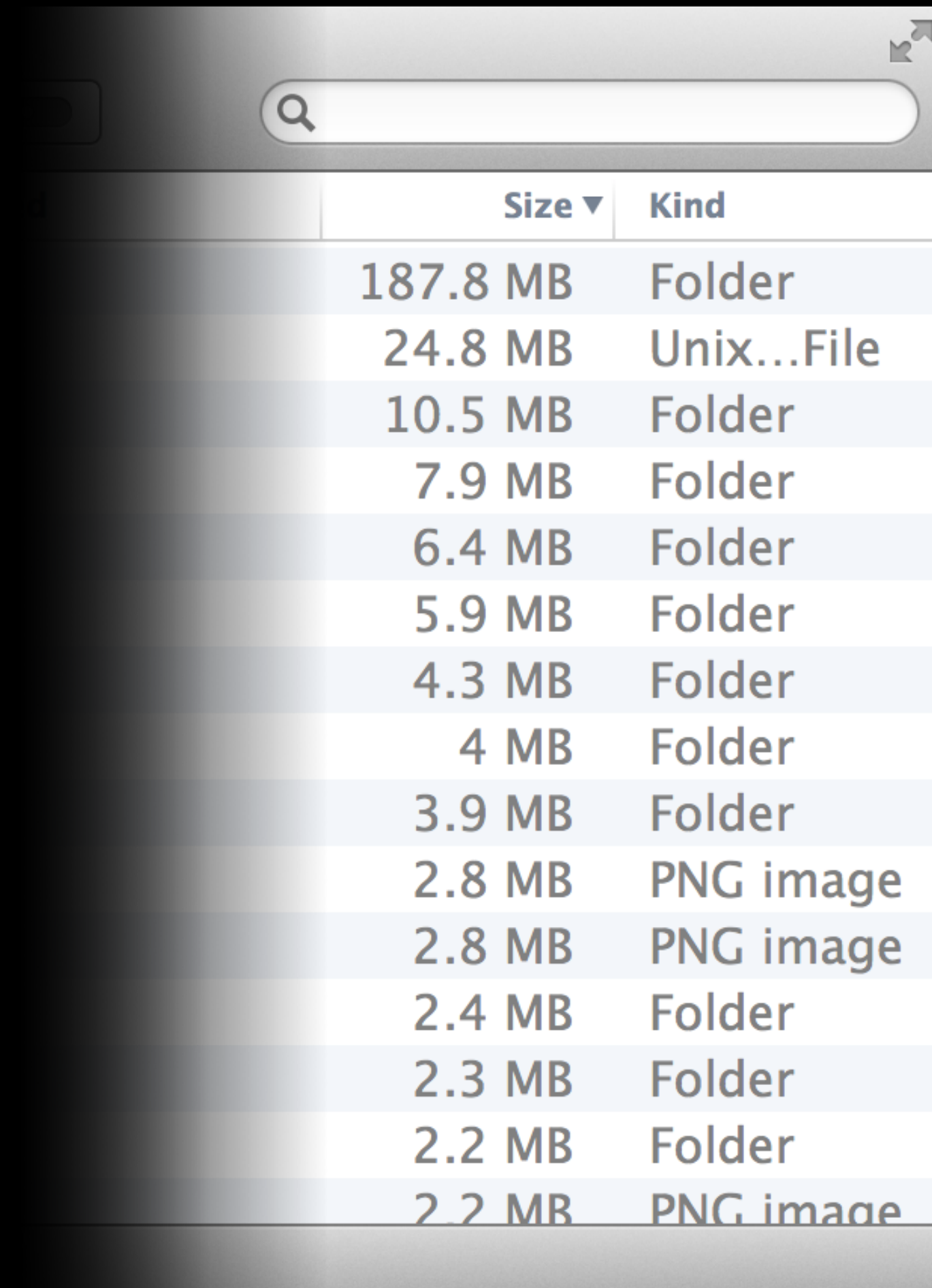


A screenshot of a macOS Finder window. The window has a title bar with a search field and a window control button. Below the title bar is a table of files. The table has three columns: Name, Size, and Kind. The files are sorted by size in descending order. The first file is a folder named 'Resources' with a size of 187.8 MB. The second file is a file named 'Info.plist' with a size of 24.8 MB and a kind of 'Unix...File'. The third file is a folder named 'Assets' with a size of 10.5 MB. The fourth file is a folder named 'Assets.xcassets' with a size of 7.9 MB. The fifth file is a folder named 'Assets.xcassets' with a size of 6.4 MB. The sixth file is a folder named 'Assets.xcassets' with a size of 5.9 MB. The seventh file is a folder named 'Assets.xcassets' with a size of 4.3 MB. The eighth file is a folder named 'Assets.xcassets' with a size of 4 MB. The ninth file is a folder named 'Assets.xcassets' with a size of 3.9 MB. The tenth file is a PNG image named 'Assets.xcassets' with a size of 2.8 MB. The eleventh file is a PNG image named 'Assets.xcassets' with a size of 2.8 MB. The twelfth file is a folder named 'Assets.xcassets' with a size of 2.4 MB. The thirteenth file is a folder named 'Assets.xcassets' with a size of 2.3 MB. The fourteenth file is a folder named 'Assets.xcassets' with a size of 2.2 MB. The fifteenth file is a PNG image named 'Assets.xcassets' with a size of 2.2 MB.

	Size ▼	Kind
	187.8 MB	Folder
	24.8 MB	Unix...File
	10.5 MB	Folder
	7.9 MB	Folder
	6.4 MB	Folder
	5.9 MB	Folder
	4.3 MB	Folder
	4 MB	Folder
	3.9 MB	Folder
	2.8 MB	PNG image
	2.8 MB	PNG image
	2.4 MB	Folder
	2.3 MB	Folder
	2.2 MB	Folder
	2.2 MB	PNG image

Take Inventory

- Open your app bundle in Finder
- Review every file
- Clean house
 - READMEs, .psd, .h and .m files
 - Stray files dragged into Xcode

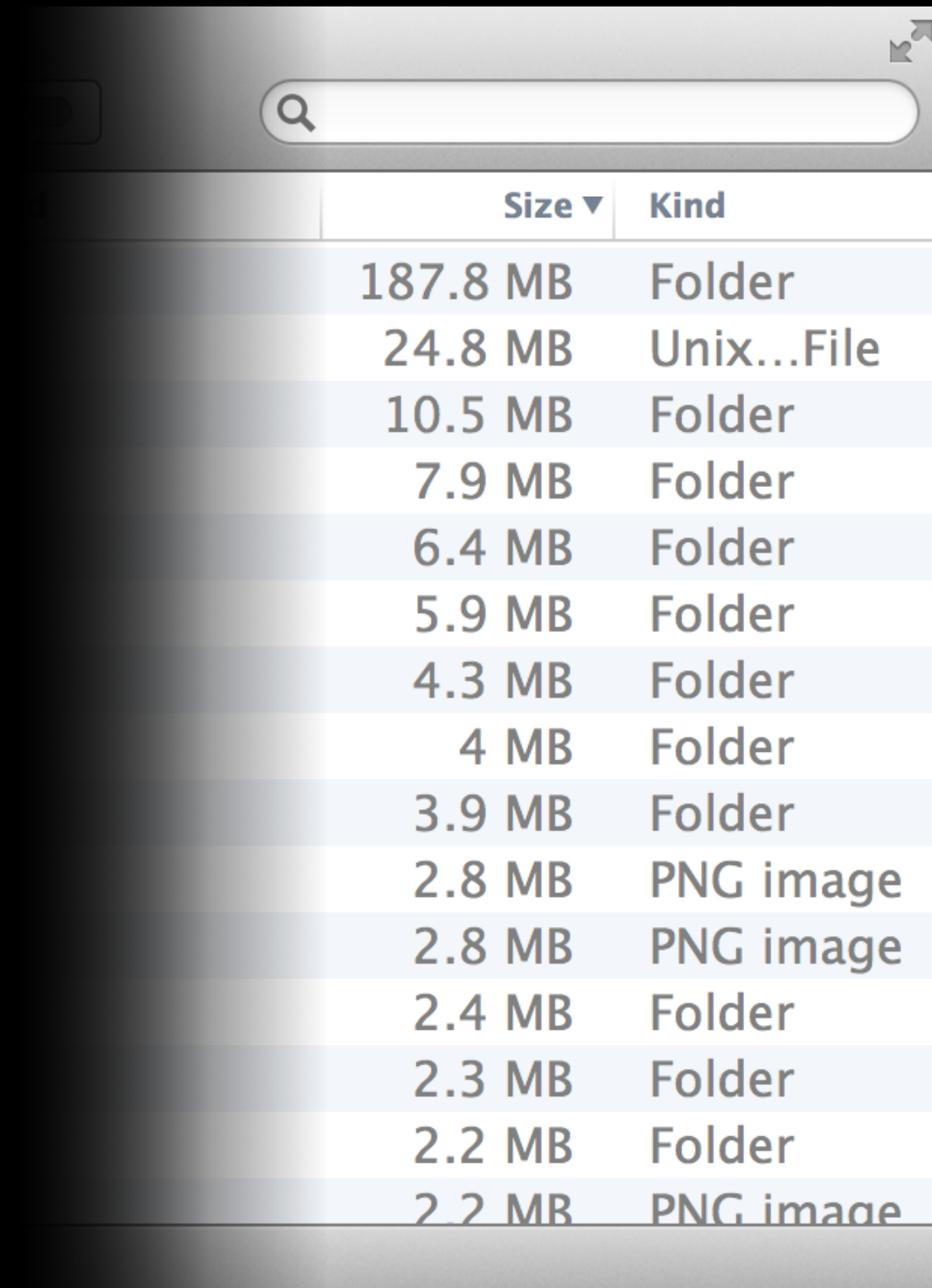


A screenshot of a macOS Finder window displaying a list of files and folders. The window has a search bar at the top. The file list is organized into three columns: Name, Size, and Kind. The files are sorted by size in descending order. The list includes several folders and two PNG images.

	Size ▼	Kind
	187.8 MB	Folder
	24.8 MB	Unix...File
	10.5 MB	Folder
	7.9 MB	Folder
	6.4 MB	Folder
	5.9 MB	Folder
	4.3 MB	Folder
	4 MB	Folder
	3.9 MB	Folder
	2.8 MB	PNG image
	2.8 MB	PNG image
	2.4 MB	Folder
	2.3 MB	Folder
	2.2 MB	Folder
	2.2 MB	PNG image

Take Inventory

- Open your app bundle in Finder
- Review every file
- Clean house
 - READMEs, .psd, .h and .m files
 - Stray files dragged into Xcode
 - Obsolete resources

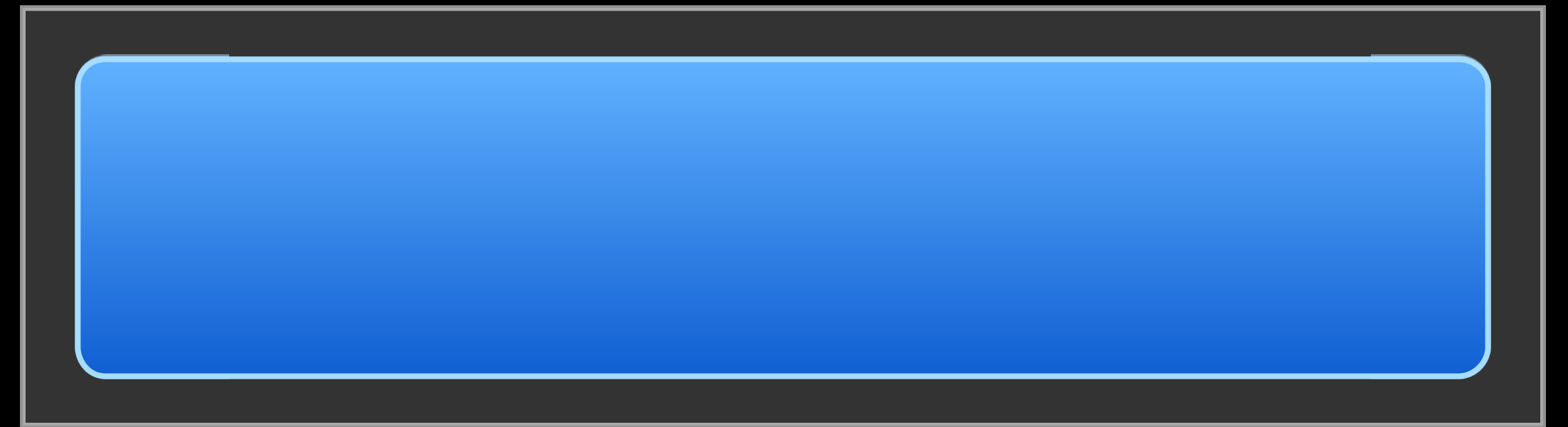


A screenshot of a macOS Finder window. The window has a search bar at the top. Below the search bar is a table with three columns: Name, Size, and Kind. The table lists various files and folders, including folders of different sizes and PNG images.

	Size ▼	Kind
	187.8 MB	Folder
	24.8 MB	Unix...File
	10.5 MB	Folder
	7.9 MB	Folder
	6.4 MB	Folder
	5.9 MB	Folder
	4.3 MB	Folder
	4 MB	Folder
	3.9 MB	Folder
	2.8 MB	PNG image
	2.8 MB	PNG image
	2.4 MB	Folder
	2.3 MB	Folder
	2.2 MB	Folder
	2.2 MB	PNG image

Take Inventory

- Open your app bundle in Finder
- Review every file
- Clean house
 - READMEs, .psd, .h and .m files
 - Stray files dragged into Xcode
 - Obsolete resources
- Use resizable images



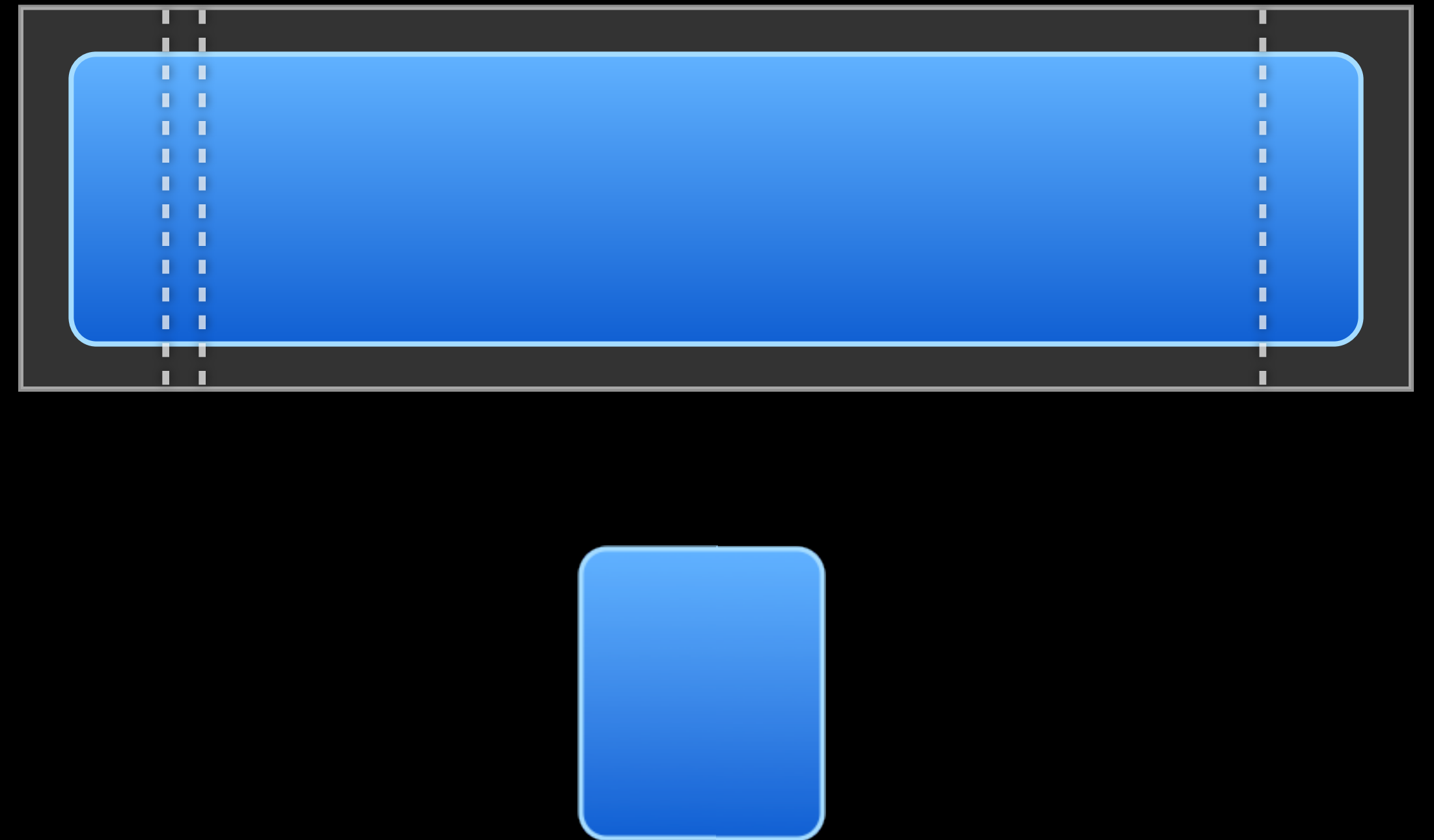
Take Inventory

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- Review every file
- Clean house
 - READMEs, .psd, .h and .m files
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Take Inventory

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- Clean house
 - READMEs, .psd, .h and .m files
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 - Obsolete resources
- Use resizable images



Take Inventory

- Open your app bundle in Finder
- Review every file
- Clean house
 - READMEs, .psd, .h and .m files
 - Stray files dragged into Xcode
 - Obsolete resources
- Use resizable images
- Dispose of the trash



Use Compression

Use Compression

- Video
 - H.264

Use Compression

- Video
 - H.264
- Audio
 - AAC or MP3 for long tracks
 - Reduce sample rates from 44.1 kHz to 22.05 kHz

Use Compression

- Video
 - H.264
- Audio
 - AAC or MP3 for long tracks
 - Reduce sample rates from 44.1 kHz to 22.05 kHz
- Images
 - Use JPG for photographic content



Minimizing Install Time

- ☐ Take inventory
- ☐ Use compression
- ☐ Download things later

Minimizing Install Time

- ☒ Take inventory
- ☒ Use compression
- ☐ Download things later

Considerations

- May not be appropriate for all apps

Considerations

- May not be appropriate for all apps
- No single answer for carving things up

Considerations

- May not be appropriate for all apps
- No single answer for carving things up
- Adds complexity
 - Need to represent status in UI
 - Have to handle cases of missing assets
 - Manage disk space
 - Complicates testing matrix

Asset Loading Strategies

Asset Loading Strategies

- After first launch
 - Platform specific assets
 - 3.5" versus 4" iPhone
 - iPad 2 versus iPad with Retina Display

Asset Loading Strategies

- After first launch
 - Platform specific assets
 - 3.5" versus 4" iPhone
 - iPad 2 versus iPad with Retina Display
- Lazily as user approaches need for them
 - Good for linear progressions
 - Levels in a game
 - Beginner, intermediate, advanced language packs

Background Transfer

Overview

Background Transfer

Overview

Background Transfer

Overview

- Service to **upload and download** data

Background Transfer

Overview

- Service to **upload and download** data
- Transfer done **out of process**

Background Transfer

Overview

- Service to **upload and download** data
- Transfer done **out of process**
 - App can suspend or be terminated
 - Intended for large amounts of data
 - Relaunched when transfers complete

Background Transfer

Overview

- Service to **upload and download** data
- Transfer done **out of process**
 - App can suspend or be terminated
 - Intended for large amounts of data
 - Relaunched when transfers complete
- Initiate using NSURLSession

NSURLSession

Initiating background download

```
// Create our session configuration
NSURLSessionConfiguration *config;
config = [NSURLSessionConfiguration backgroundSessionConfiguration:@"MyOtherAssets"];
```

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NSURLSession

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```
// Create our session configuration
NSURLSessionConfiguration *config;
config = [NSURLSessionConfiguration backgroundSessionConfiguration:@"MyOtherAssets"];
```

```
// create the background session
self.session = [NSURLSession sessionWithConfiguration:config delegate:self
                delegateQueue:[NSOperationQueue mainQueue]];
```

NSURLSession

Initiating background download

```
// Create our session configuration
NSURLSessionConfiguration *config;
config = [NSURLSessionConfiguration backgroundSessionConfiguration:@"MyOtherAssets"];

// create the background session
self.session = [NSURLSession sessionWithConfiguration:config delegate:self
                                                    delegateQueue:[NSOperationQueue mainQueue]];

NSURL *remoteURL = ... // URL to asset

NSURLSessionDownloadTask *task = [self.session downloadTaskWithURL:remoteURL];
```


NSURLSession

Initiating background download

```
// Create our session configuration
NSURLSessionConfiguration *config;
config = [NSURLSessionConfiguration backgroundSessionConfiguration:@"MyOtherAssets"];

// create the background session
self.session = [NSURLSession sessionWithConfiguration:config delegate:self
                                                    delegateQueue:[NSOperationQueue mainQueue]];

NSURL *remoteURL = ... // URL to asset

NSURLSessionDownloadTask *task = [self.session downloadTaskWithURL:remoteURL];

// Tasks are created paused, so resume it to start download
[task resume];
```

NSURLSession

NSURLSession

- Tasks support suspend, resume, cancel

NSURLSession

- Tasks support suspend, resume, cancel
- When complete, app resumed in background
 - (void)**application:**(UIApplication *)application
 handleEventsForBackgroundURLSession:(NSString *)identifier
 completionHandler:(void (^)(void))completionHandler;

NSURLSession

- Tasks support suspend, resume, cancel
- When complete, app resumed in background
 - (void)**application**:(UIApplication *)application
 handleEventsForBackgroundURLSession:(NSString *)identifier
 completionHandler:(void (^)(void))completionHandler;
- Re-establish session, handle results

Delegate Considerations

Delegate Considerations

- Short amount of time to handle results
 - Inspect `backgroundTimeRemaining`



Delegate Considerations

- Short amount of time to handle results
 - Inspect `backgroundTimeRemaining`
- Be sure to call completion handler
 - May be terminated if you fail to



Delegate Considerations

- Short amount of time to handle results
 - Inspect `backgroundTimeRemaining`
- Be sure to call completion handler
 - May be terminated if you fail to
- Be aware of Data Protection
 - May be running while `device is locked`
 - Keychain items and files may not be available



Storing Downloaded Data

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- NSURLSession holds data temporarily
 - To keep it, move it into your sandbox

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- Adhere to iOS Data Storage Guidelines
 - App Review takes these into consideration

Storing Downloaded Data

- NSURLSession holds data temporarily
 - To keep it, move it into your sandbox
- Adhere to iOS Data Storage Guidelines
 - App Review takes these into consideration
- To exclude from backup, set **NSURLIsExcludedFromBackupKey**

```
NSURL *myURL = ... // Local file URL in app sandbox
BOOL success = [myURL setResourceValue:@YES
                    forKey:NSURLIsExcludedFromBackupKey error:&error];
```

Minimizing Install Time

- ☒ Take inventory
- ☒ Use compression
- ☐ Download things later

Minimizing Install Time

- Take inventory
- Use compression
- Download things later

Background Transfers

Recap

Background Transfers

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- Clean up, compress, and possibly split up files

Background Transfers

Recap

- Clean up, compress, and possibly split up files
- Use NSURLSession
 - Background upload and download
 - Future of Foundation networking

Background Transfers

Recap

- Clean up, compress, and possibly split up files
- Use NSURLSession
 - Background upload and download
 - Future of Foundation networking
- iOS Data Storage guidelines
 - Exclude files from backups

Agenda

Background Transfers

Multitasking

iBeacon

Agenda

Background Transfers

Multitasking

iBeacon





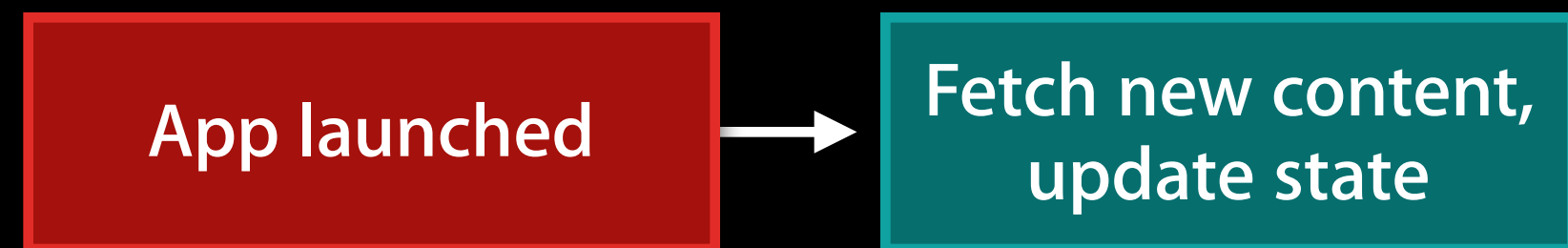




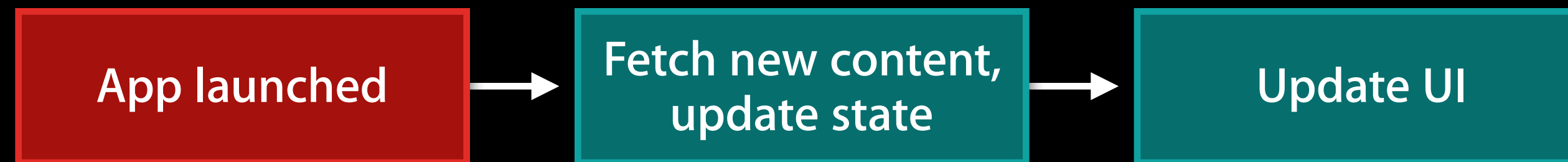
App Switcher Snapshots

App launched

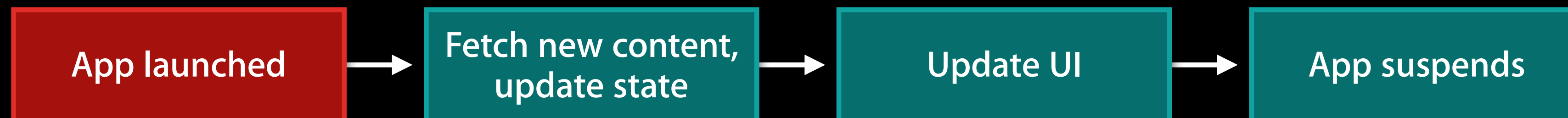
App Switcher Snapshots



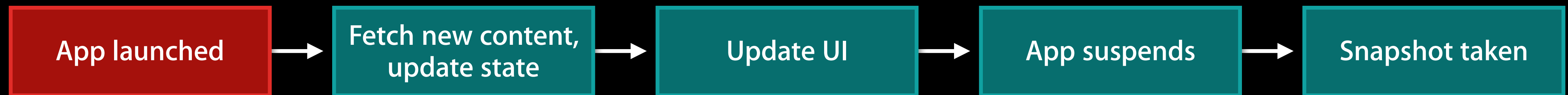
App Switcher Snapshots



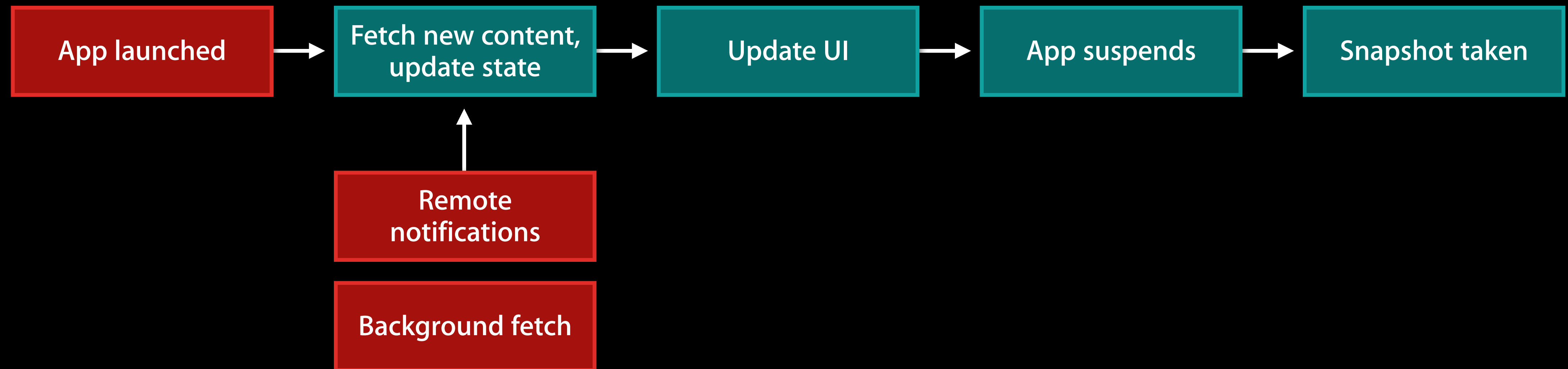
App Switcher Snapshots



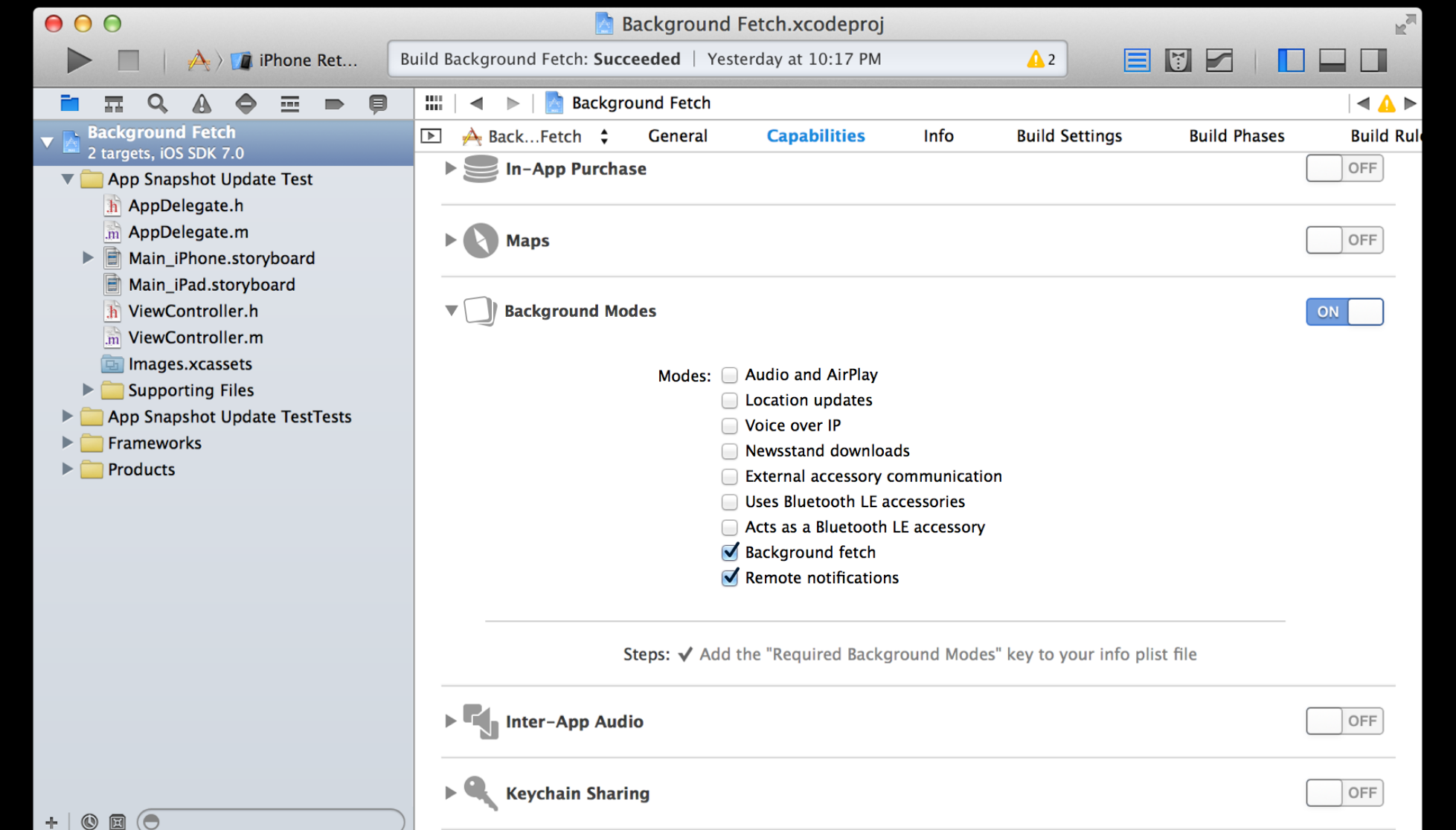
App Switcher Snapshots



App Switcher Snapshots

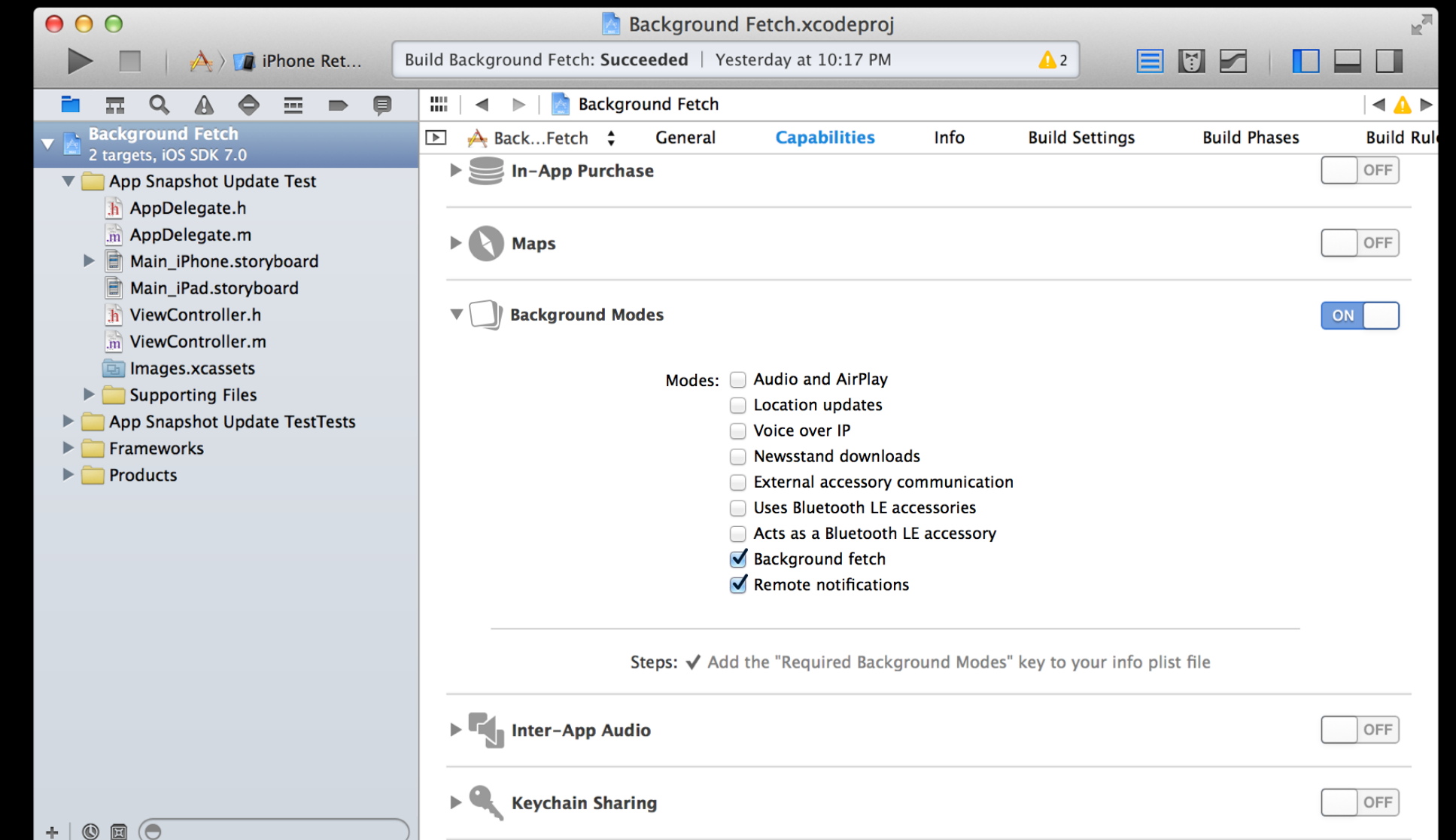


iOS 7 Multitasking



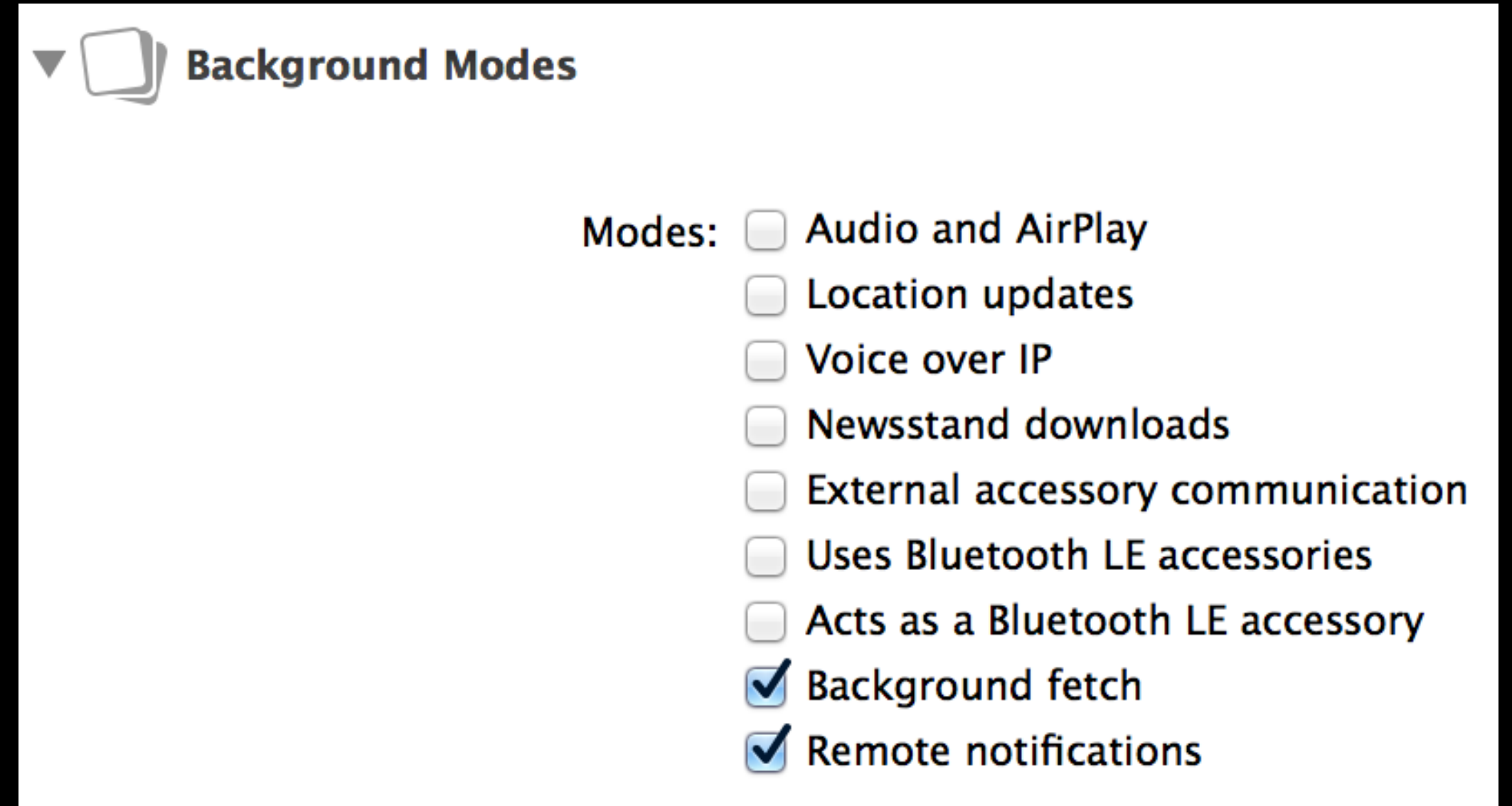
iOS 7 Multitasking

- New background modes



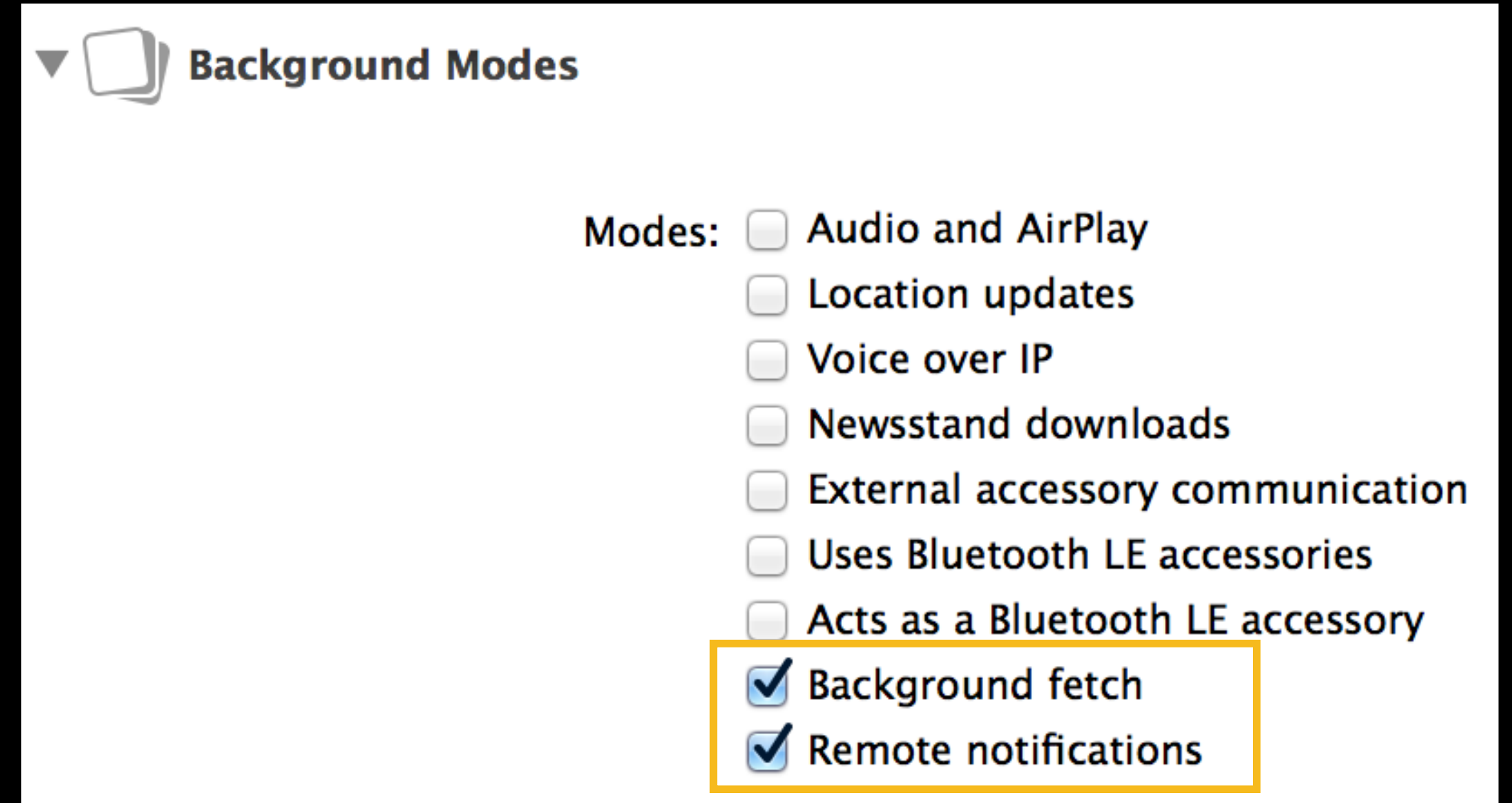
iOS 7 Multitasking

- New background modes



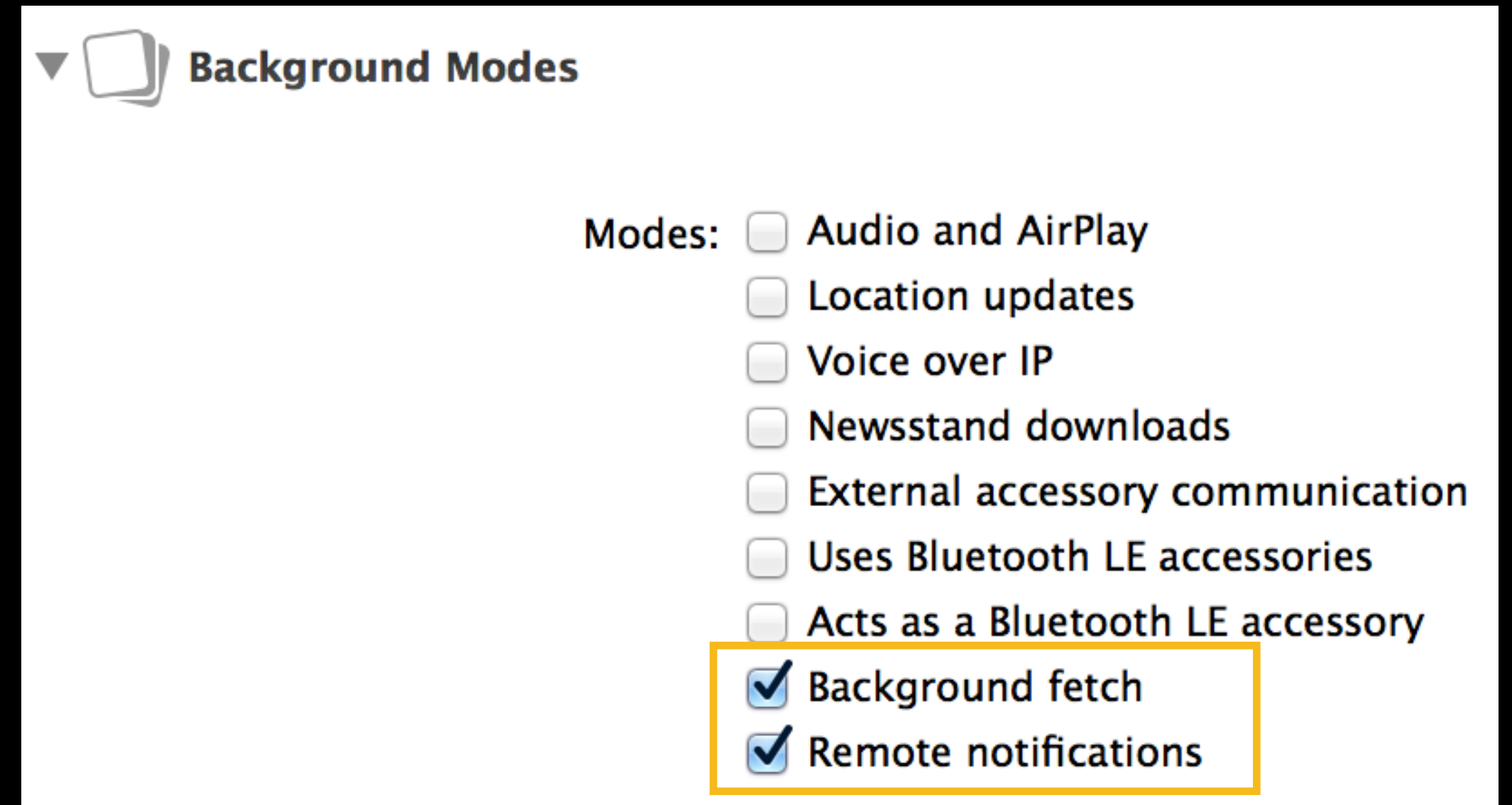
iOS 7 Multitasking

- New background modes



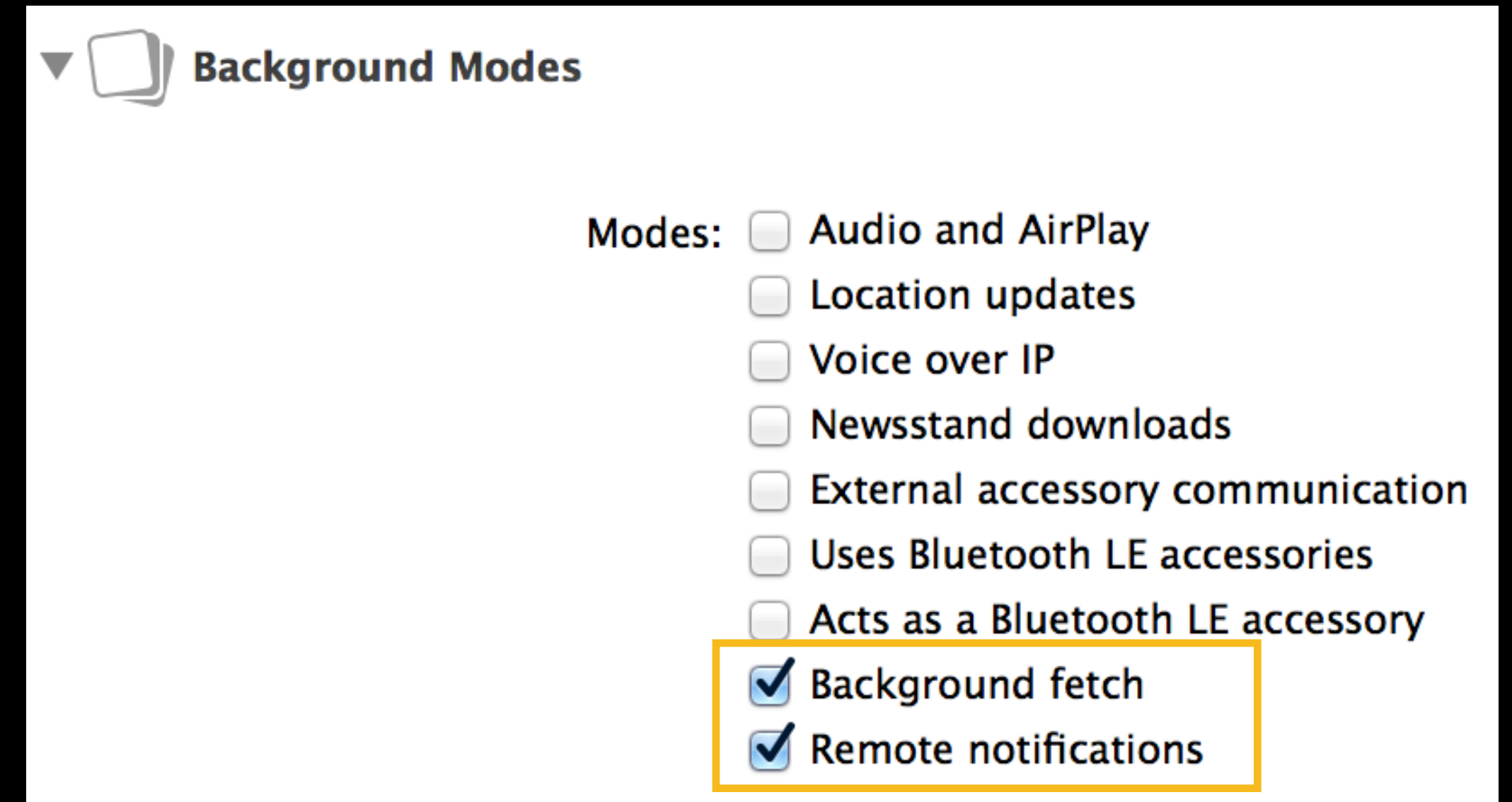
iOS 7 Multitasking

- New background modes
- Available to all apps



iOS 7 Multitasking

- New background modes
- Available to all apps
- Power smart



Remote Notifications

Overview

Remote Notifications

Overview

- Push delivered to app
 - Even when not frontmost

Remote Notifications

Overview

- Push delivered to app
 - Even when not frontmost

```
aps {  
  alert: "You've got mail."  
}
```

Remote Notifications

Overview

- Push delivered to app
 - Even when not frontmost
- If **alert** or **sound** in push payload
 - Delivered to app when user notified

```
aps {  
  alert: "You've got mail."  
  content-available: 1  
}
```

Remote Notifications

Overview

- Push delivered to app
 - Even when not frontmost
- If **alert** or **sound** in push payload
 - Delivered to app when user notified
- If no **alert** or **sound**
 - Silent push, user not notified
 - May be throttled

```
aps {  
  alert: "You've got mail."  
  content-available: 1  
}
```

```
aps {  
  content-available: 1  
}
```

Background Fetch

Overview

Background Fetch

Overview

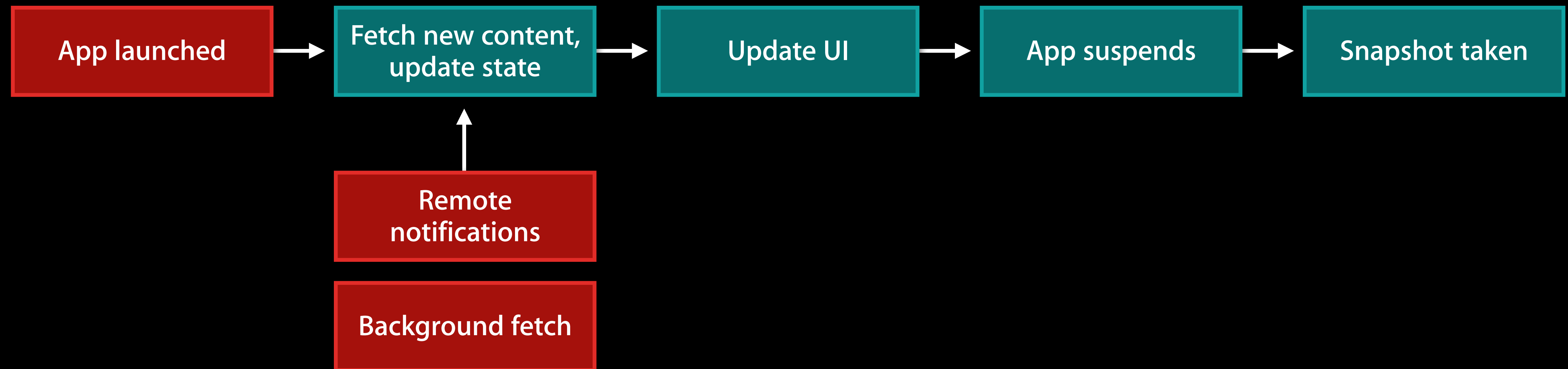
- Opportunity to fetch content in background
 - Fetch latest game state or social feeds
 - Update app snapshot

Background Fetch

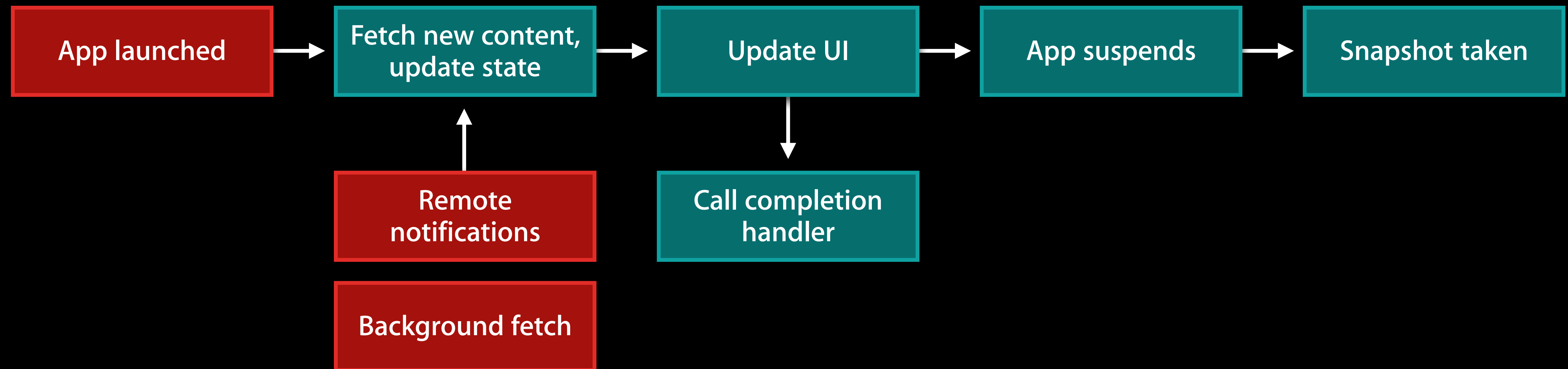
Overview

- Opportunity to fetch content in background
 - Fetch latest game state or social feeds
 - Update app snapshot
- Initiated by iOS
 - Based on previous usage
 - At opportune times
 - Be prepared to run in the background when allowed

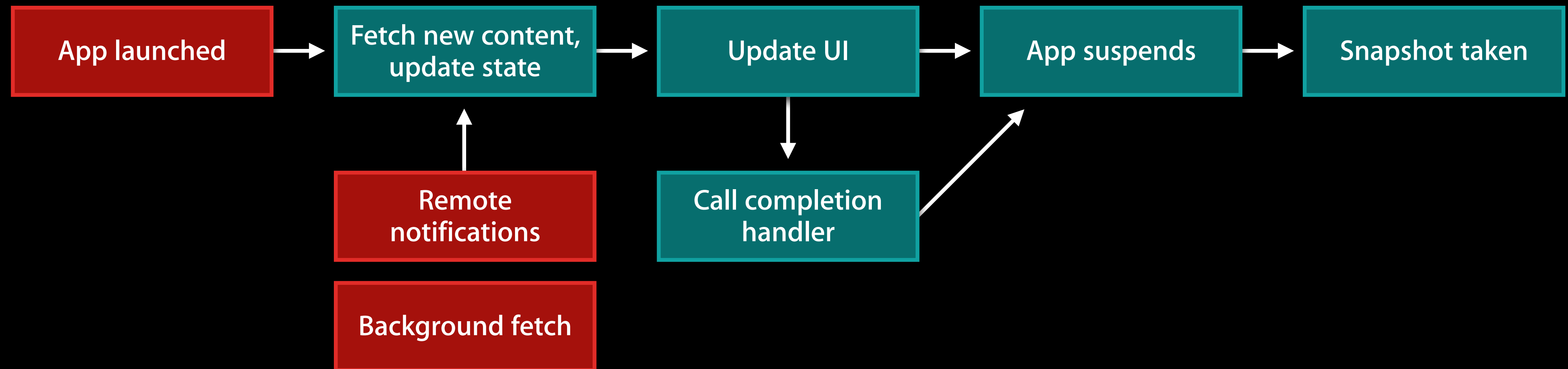
App Switcher Snapshots



App Switcher Snapshots



App Switcher Snapshots



Updating Content



Updating Content

- Call completion handler as soon as possible



Updating Content

- Call completion handler as soon as possible
- Keep fetches small
 - Use background transfers for large data



Updating Content

- Call completion handler as soon as possible
- Keep fetches small
 - Use background transfers for large data
- OK to use OpenGL ES
 - Render single frame if possible



Updating Content

- Be aware of Data Protection
 - May be running when **device is locked**
 - Keychain items and files may not be available



Multitasking

Recap



Multitasking

Recap

- Keep your apps and snapshots up to date



Multitasking

Recap

- Keep your apps and snapshots up to date
- Remote Notifications
 - Silent push and background notifications



Multitasking

Recap

- Keep your apps and snapshots up to date
- Remote Notifications
 - Silent push and background notifications
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 - Update ahead of launch



Multitasking

Recap

- Keep your apps and snapshots up to date
- Remote Notifications
 - Silent push and background notifications
- Background fetch
 - Update ahead of launch
- Be aware of running when **device is locked**



Agenda

Background Transfers

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iBeacon

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iBeacon



iBeacon



iBeacon

Region
Monitoring



iBeacon

Region
Monitoring



Ranging

iBeacon

Region Monitoring

- Same Core Location API as geofences



iBeacon

Region Monitoring

- Same Core Location API as geofences
- More flexible
 - Monitor mobile objects



iBeacon

Region Monitoring

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iBeacon

Region Monitoring

- Same Core Location API as geofences
- More flexible
 - Monitor mobile objects
 - More accurate indoors



iBeacon

Region Monitoring

- Same Core Location API as geofences
- More flexible
 - Monitor mobile objects
 - More accurate indoors
- Passbook relevance



iBeacon

Ranging

iBeacon

Ranging

- New Core Location APIs in iOS 7

iBeacon

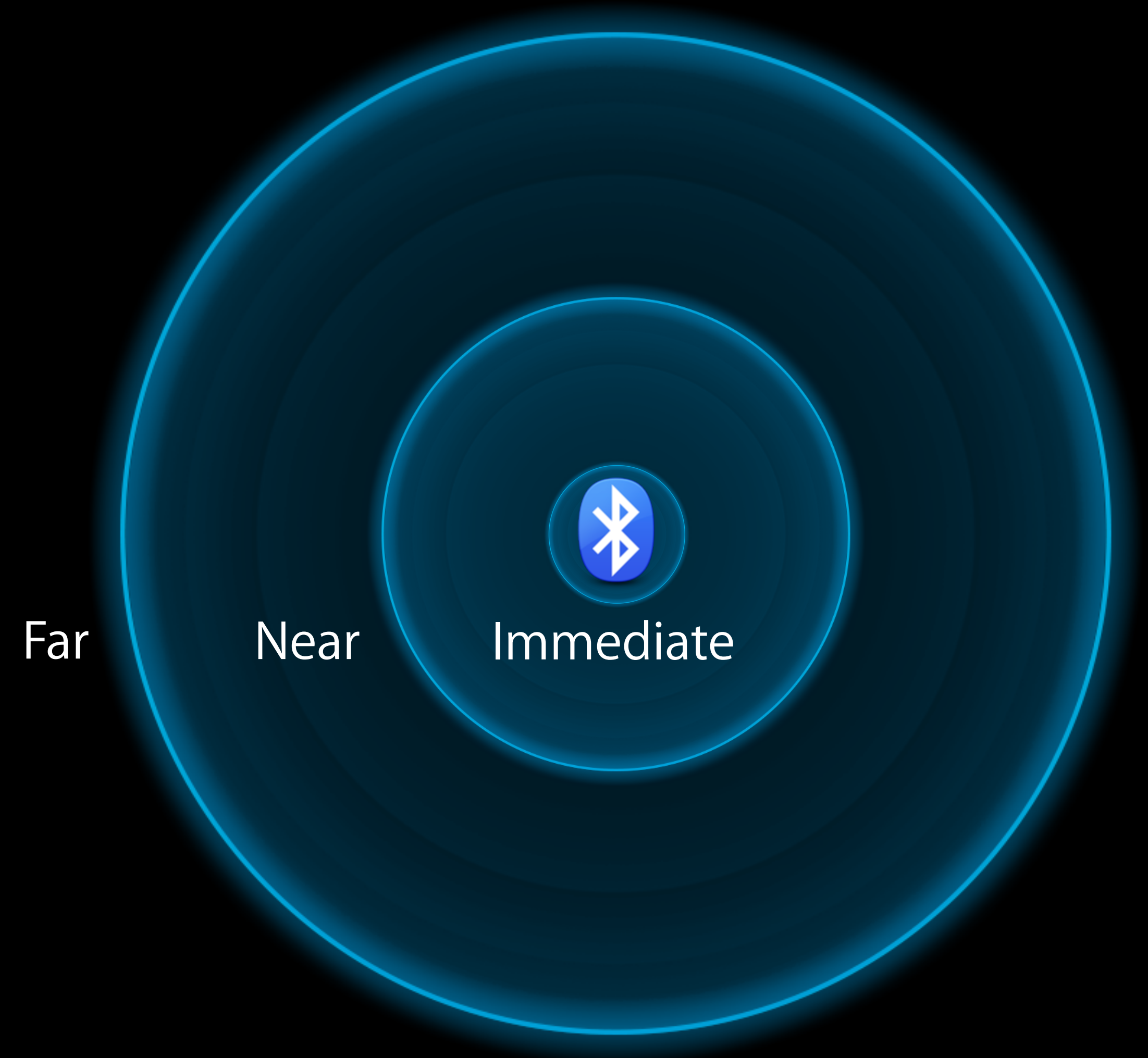
Ranging

- New Core Location APIs in iOS 7
- Proximity to iBeacon

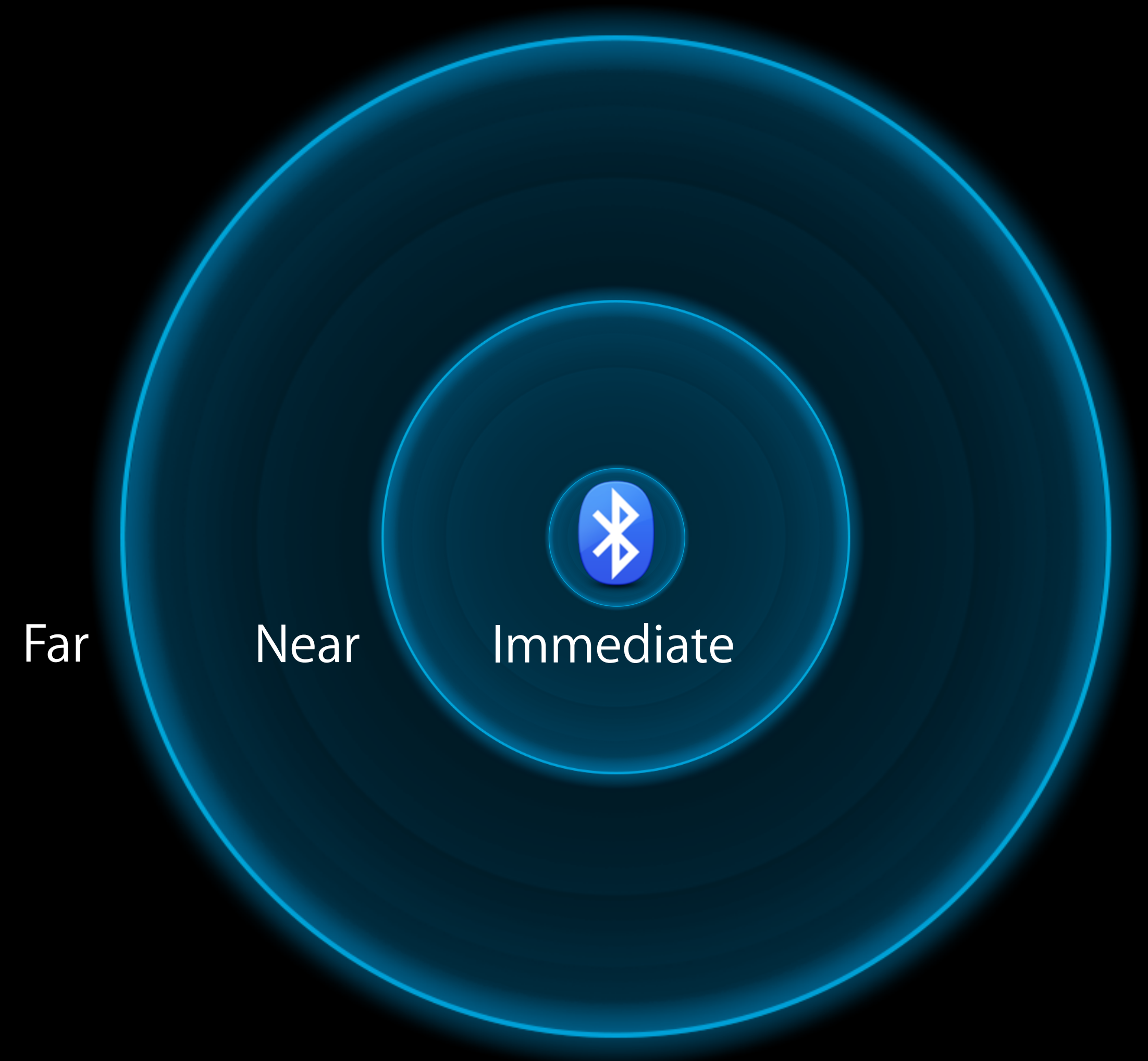
iBeacon

Ranging

- New Core Location APIs in iOS 7
- Proximity to iBeacon
- Categorized into 3 zones
 - Immediate
 - Near
 - Far

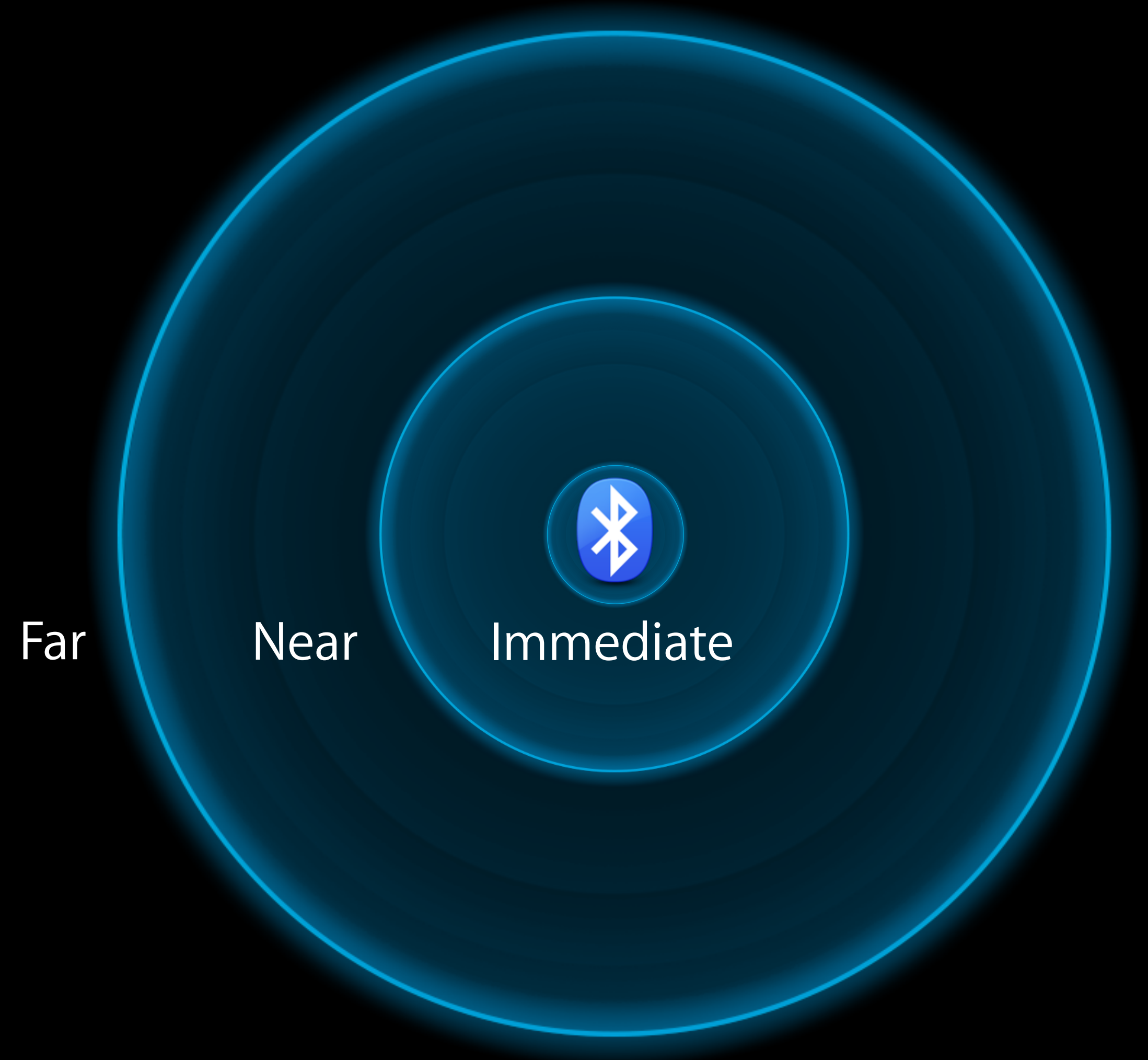


Proximity Zones



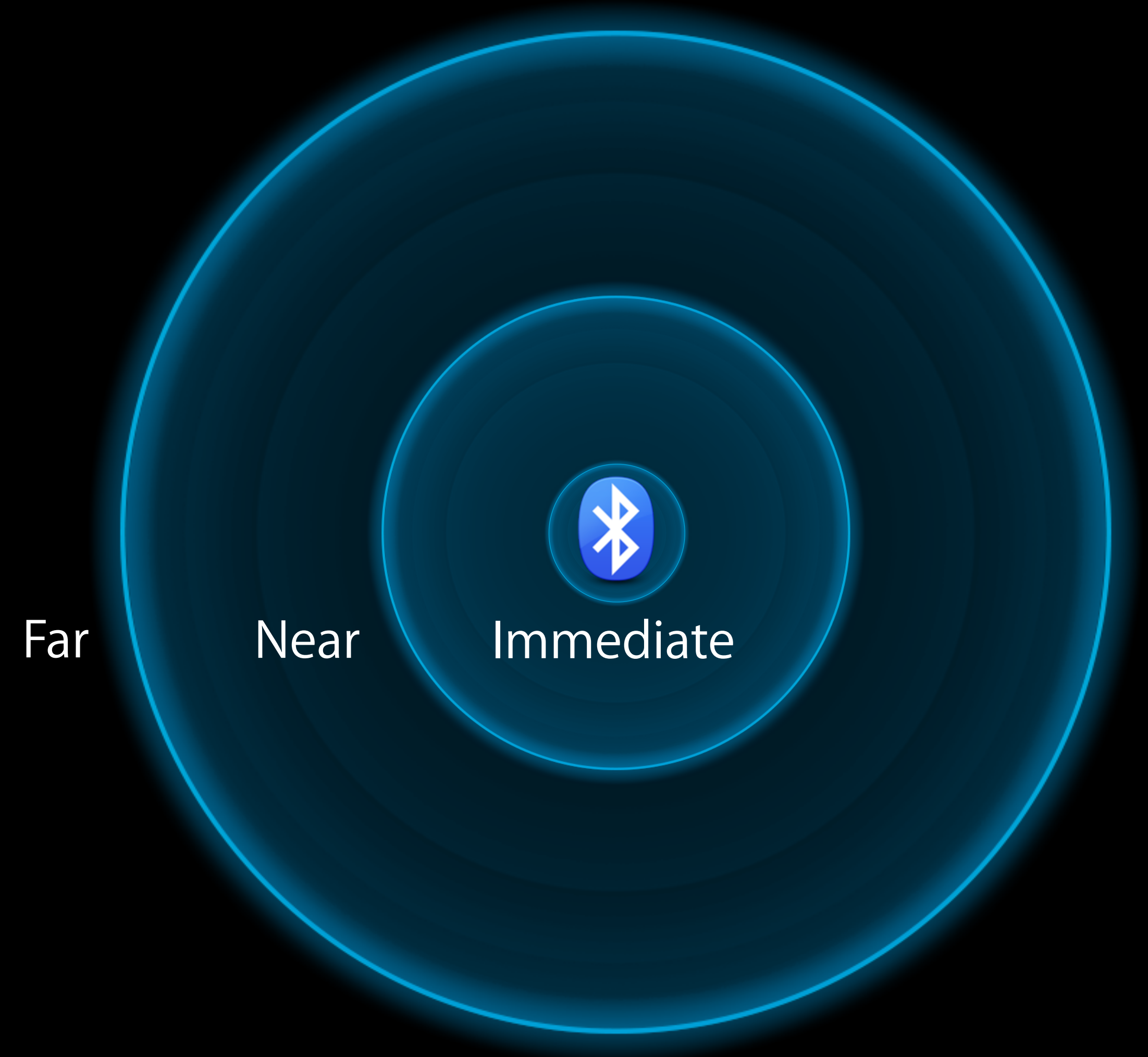
Proximity Zones

- Immediate
 - Device held up close to beacon
 - Highly confident



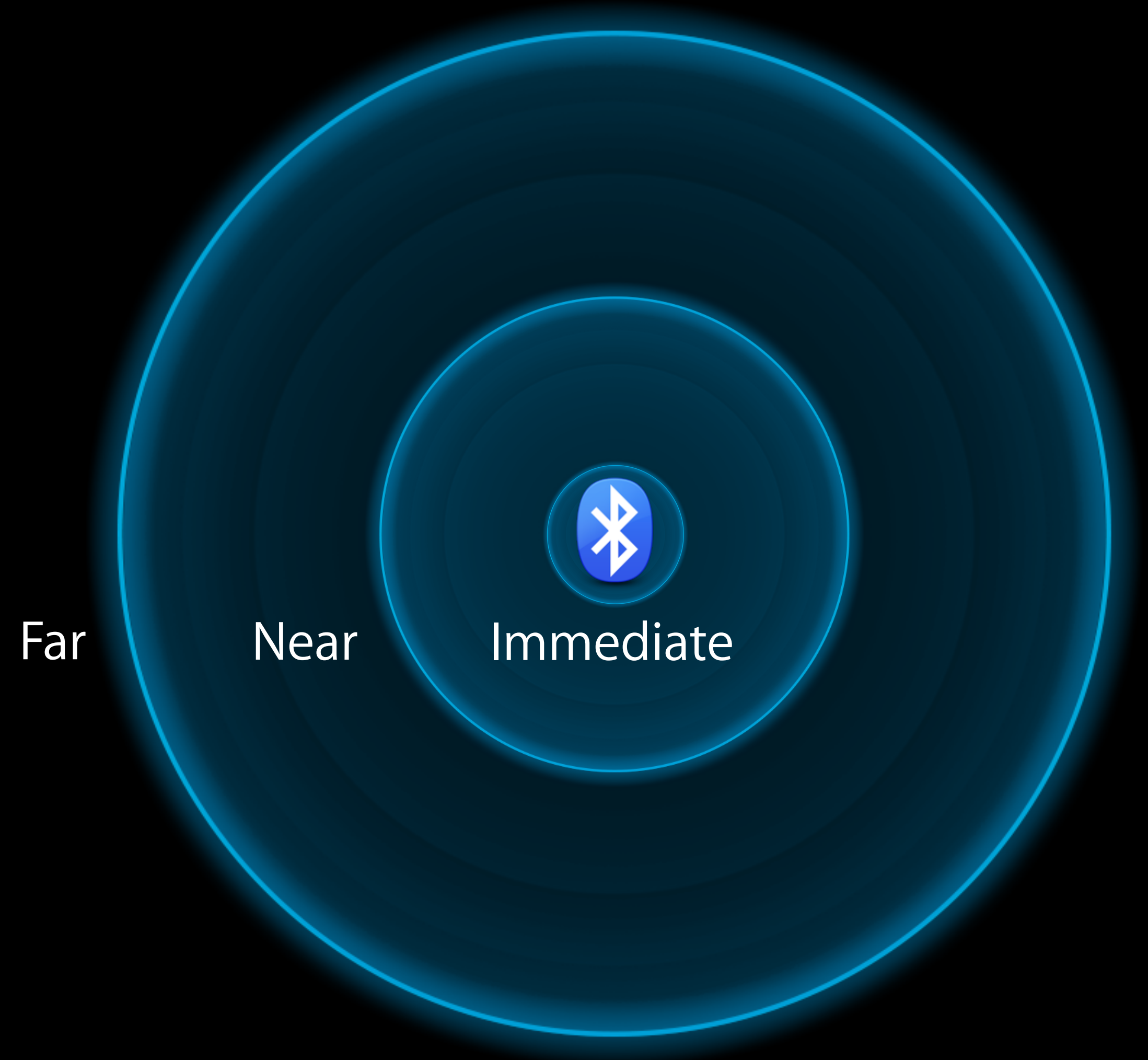
Proximity Zones

- Immediate
 - Device held up close to beacon
 - Highly confident
- Near
 - Within a couple meters
 - Fairly certain



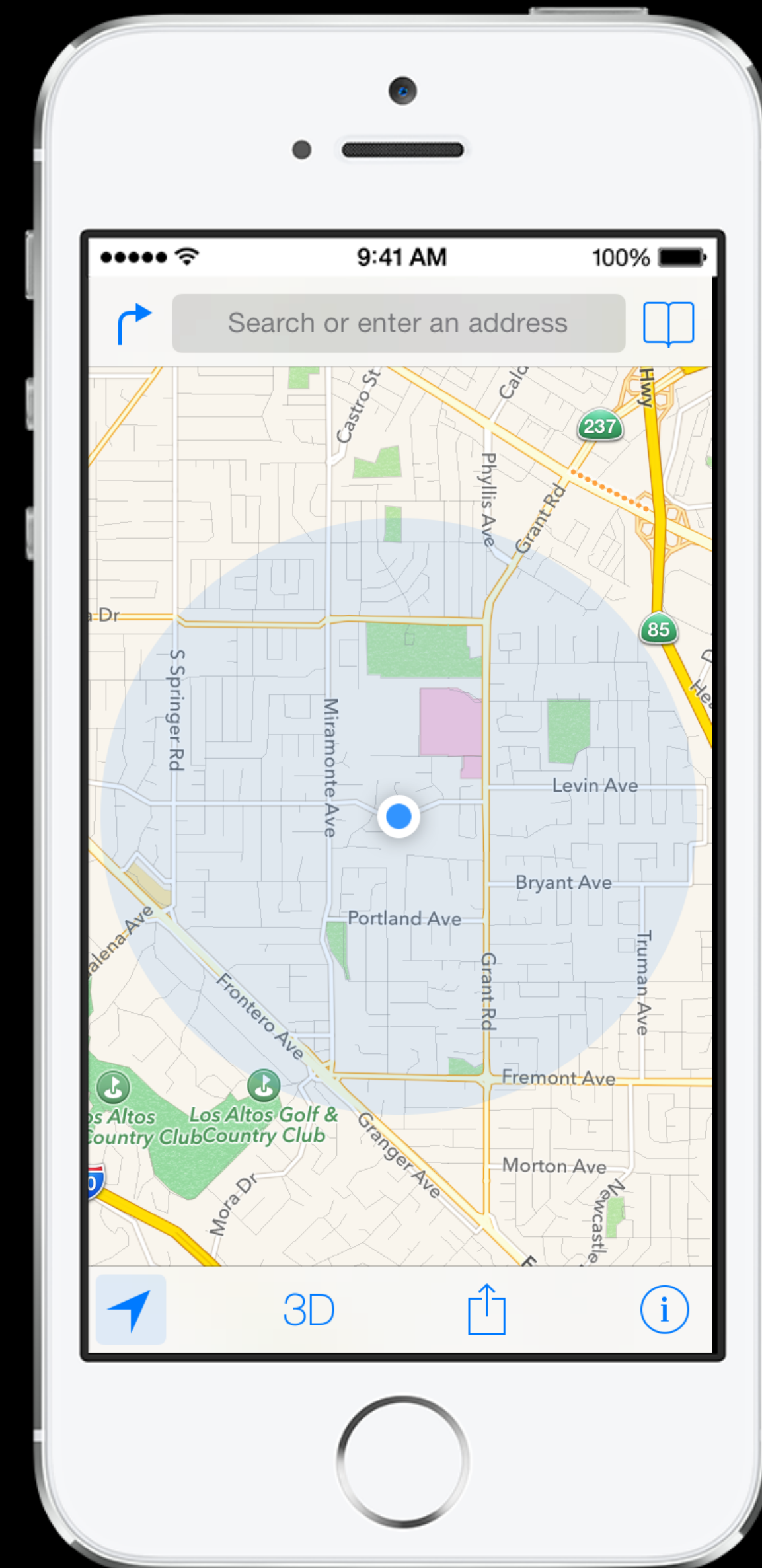
Proximity Zones

- Immediate
 - Device held up close to beacon
 - Highly confident
- Near
 - Within a couple meters
 - Fairly certain
- Far
 - Likely more than a few meters
 - Or signal strength is too weak



iBeacon Ranging

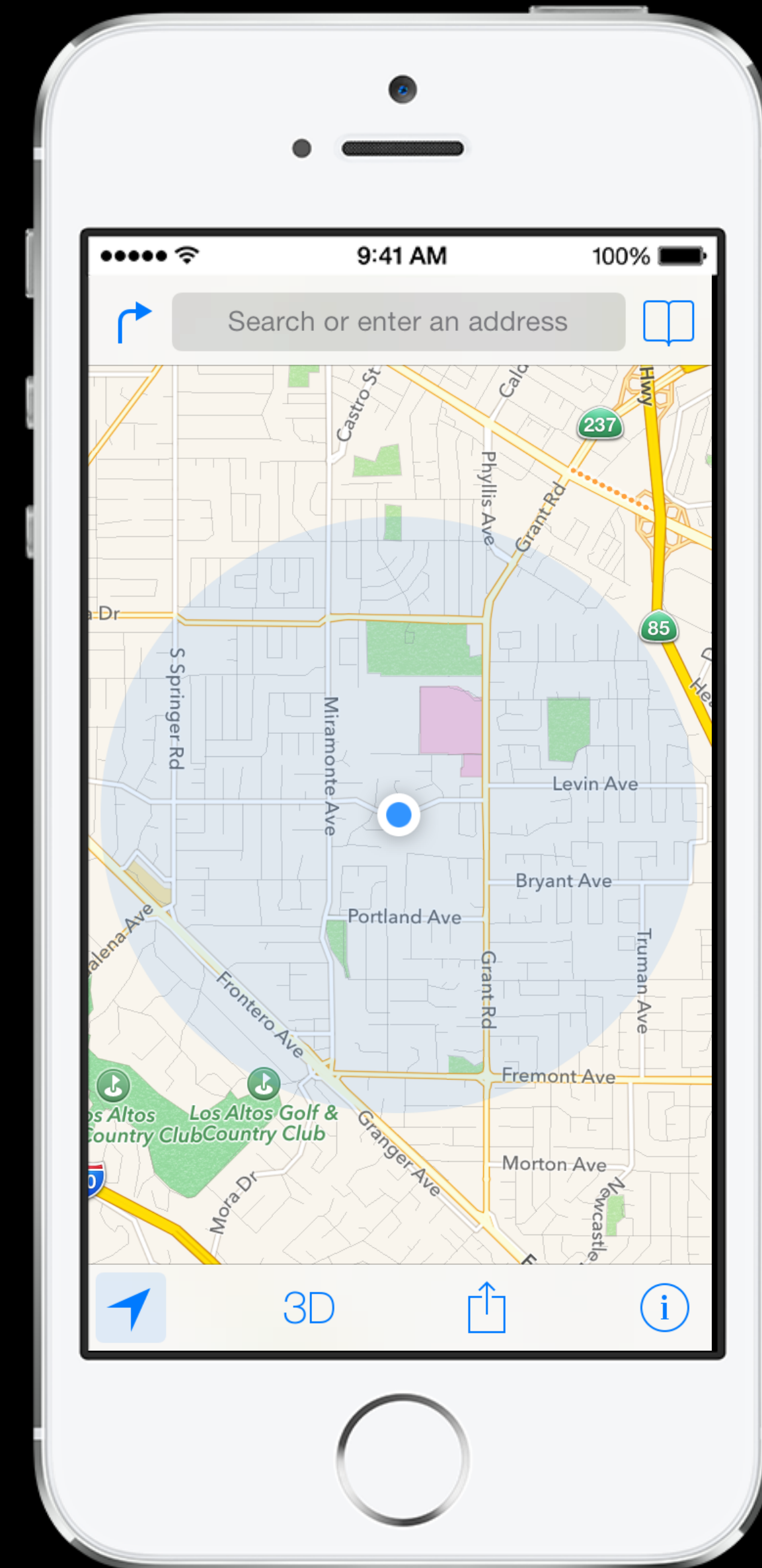
Accuracy



iBeacon Ranging

Accuracy

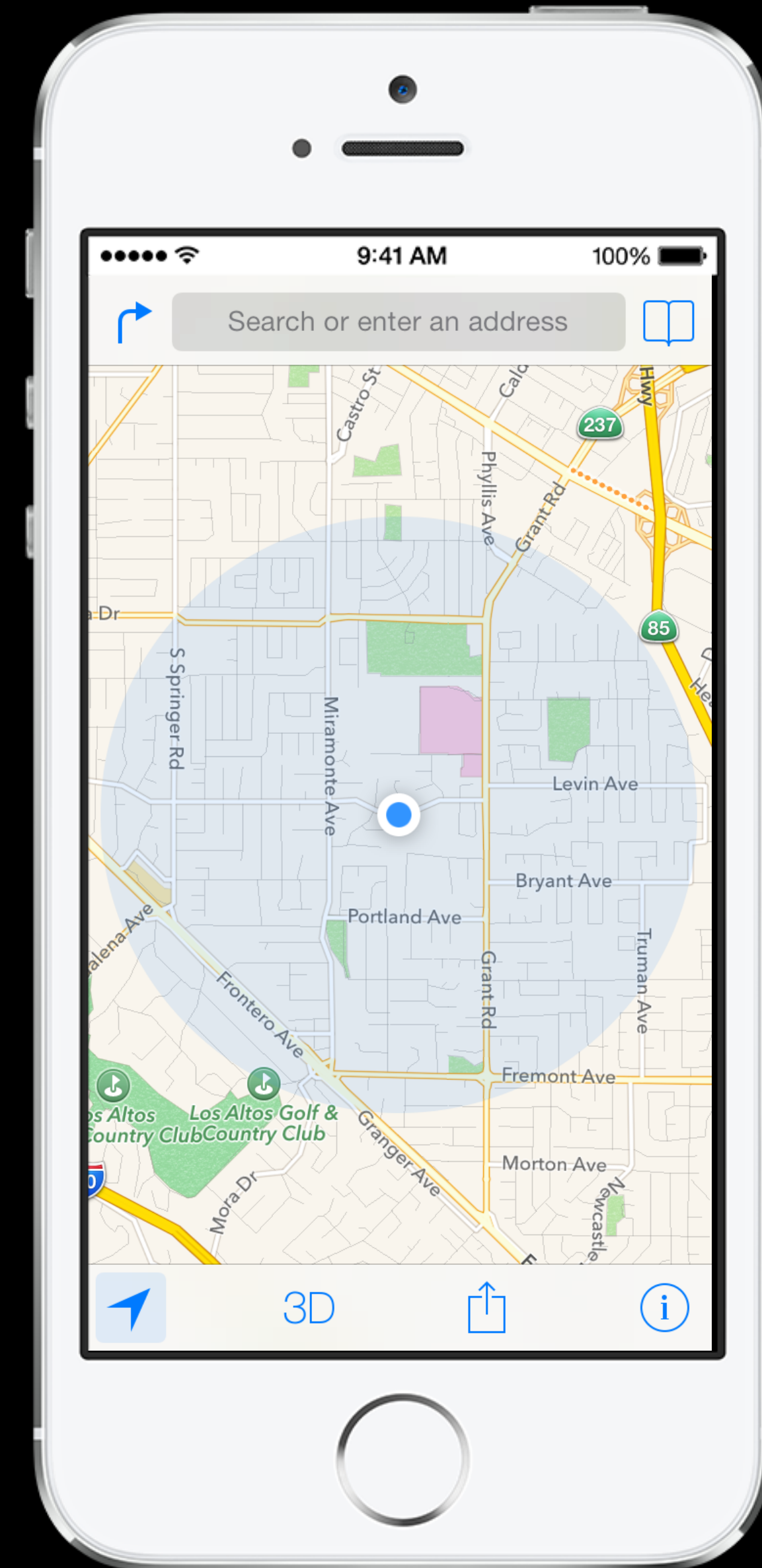
- Accuracy similar to GPS



iBeacon Ranging

Accuracy

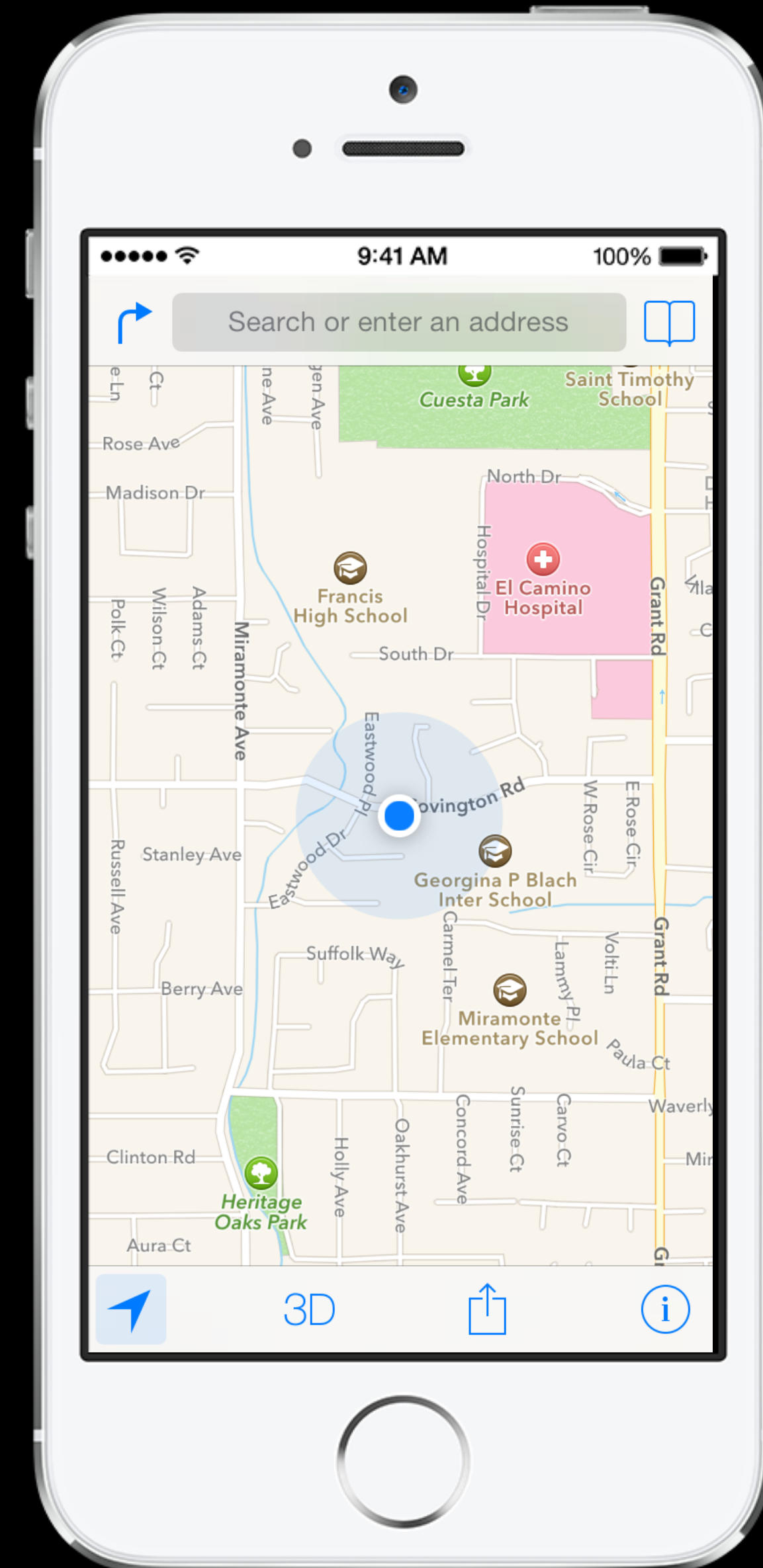
- Accuracy similar to GPS
- Weaker signal
 - High margin of error



iBeacon Ranging

Accuracy

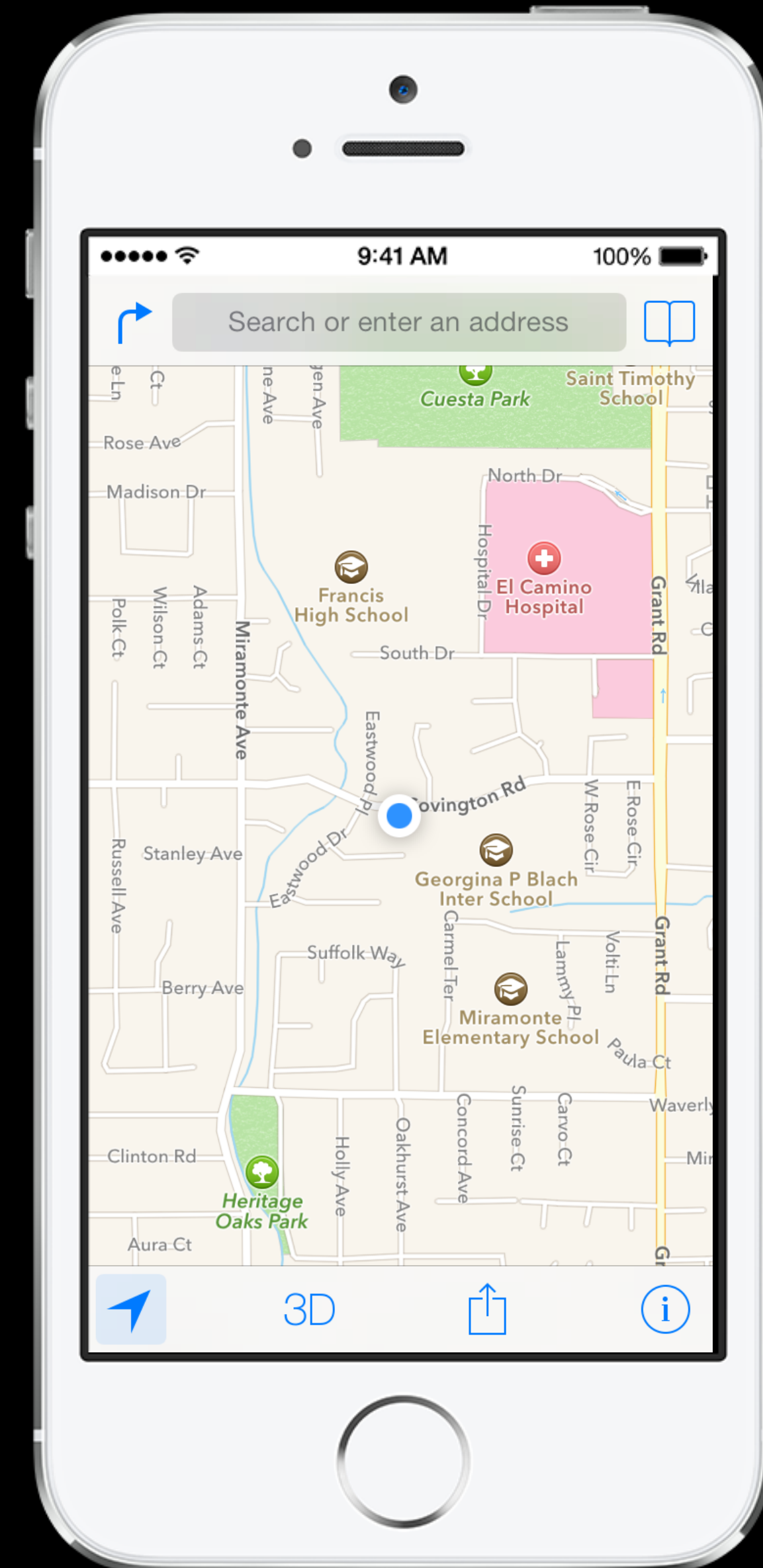
- Accuracy similar to GPS
- Weaker signal
 - High margin of error
- Stronger signal
 - Lower margin of error



iBeacon Ranging

Accuracy

- Accuracy similar to GPS
- Weaker signal
 - High margin of error
- Stronger signal
 - Lower margin of error
- Strongest signal
 - Clear line of sight to satellites
 - Very confident of position



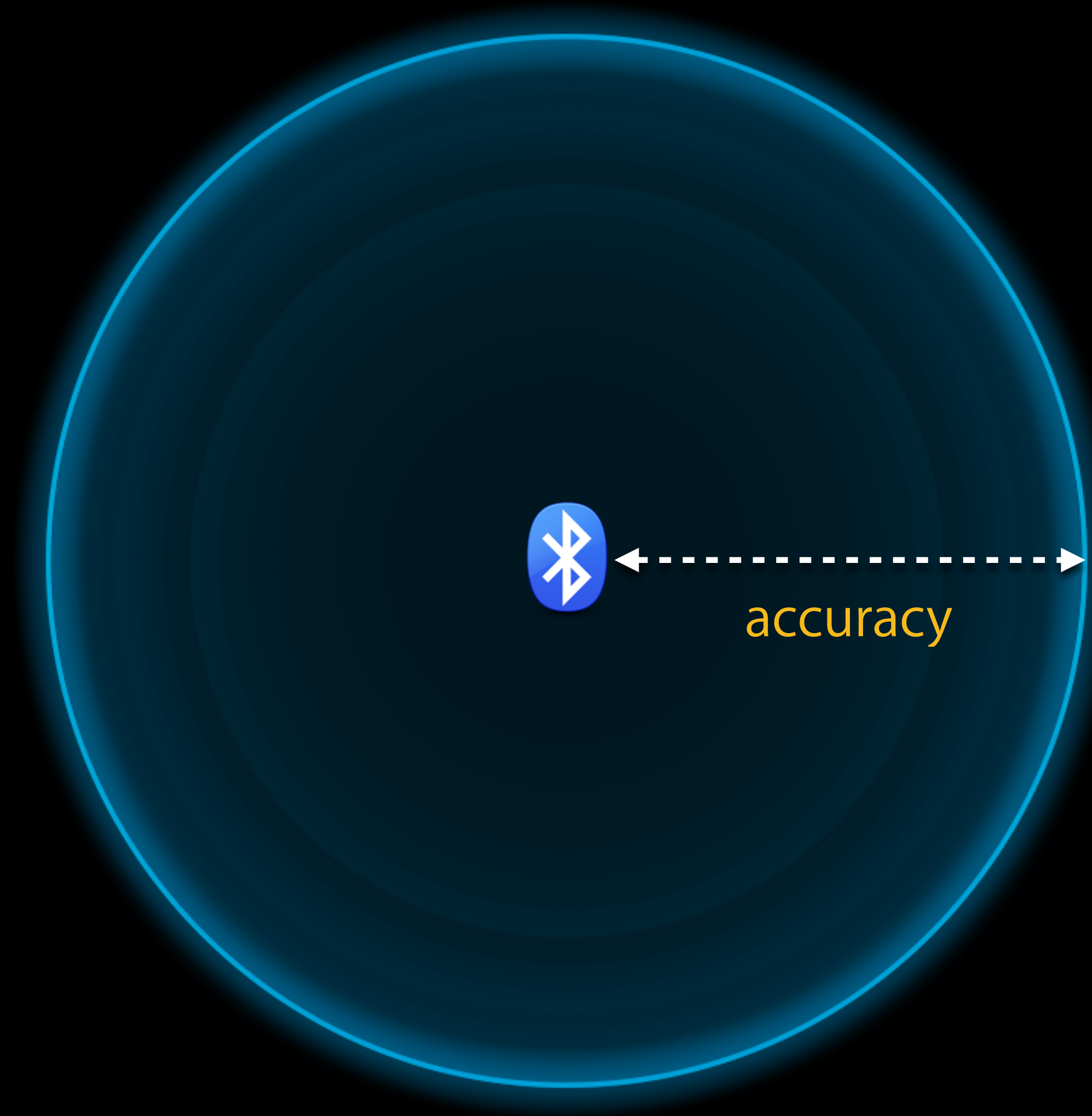
iBeacon Ranging

Accuracy



iBeacon Ranging

Accuracy

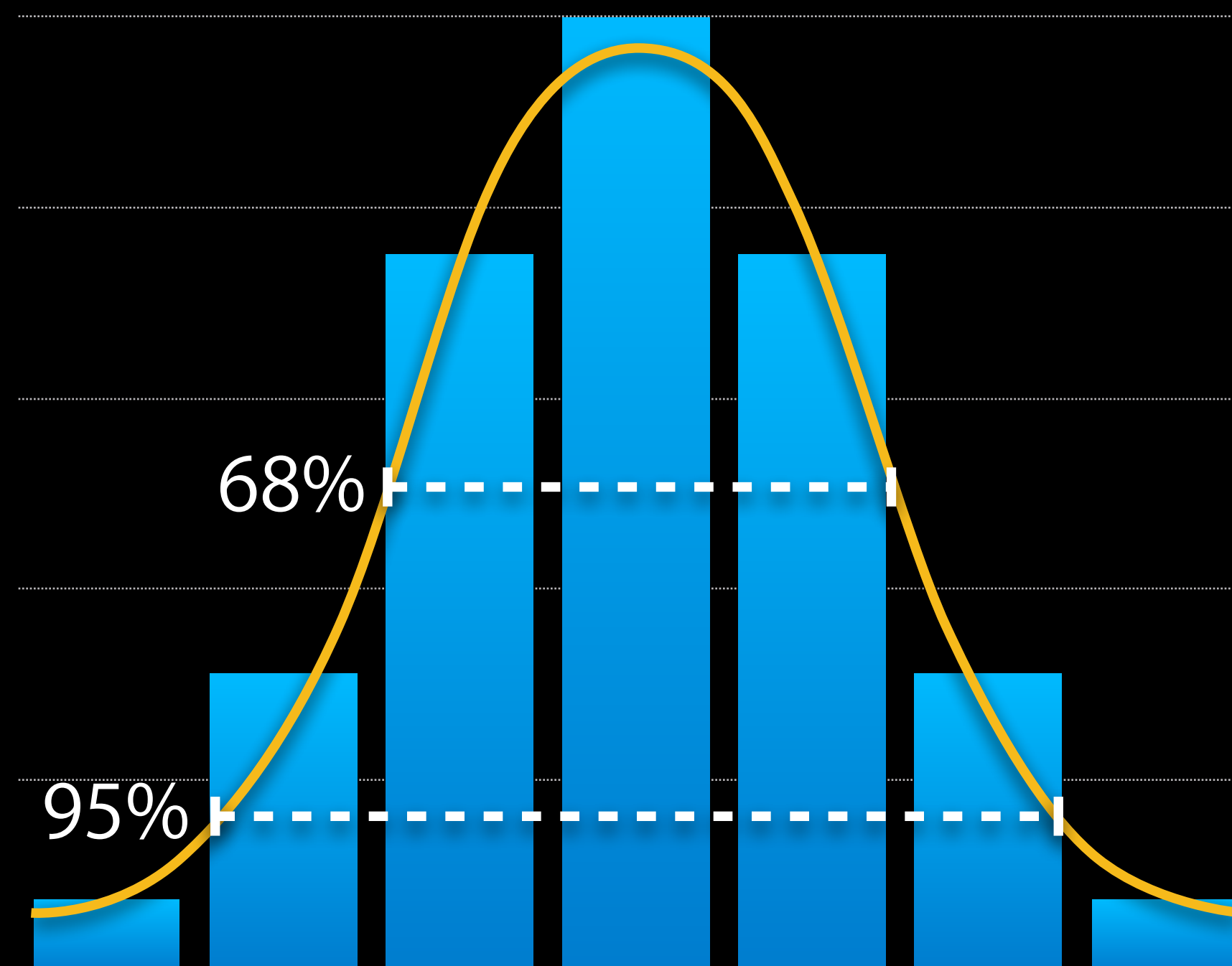


iBeacon Ranging

Accuracy

iBeacon Ranging

Accuracy



1-sigma estimate
95% confidence at 2x

Signal Attenuation



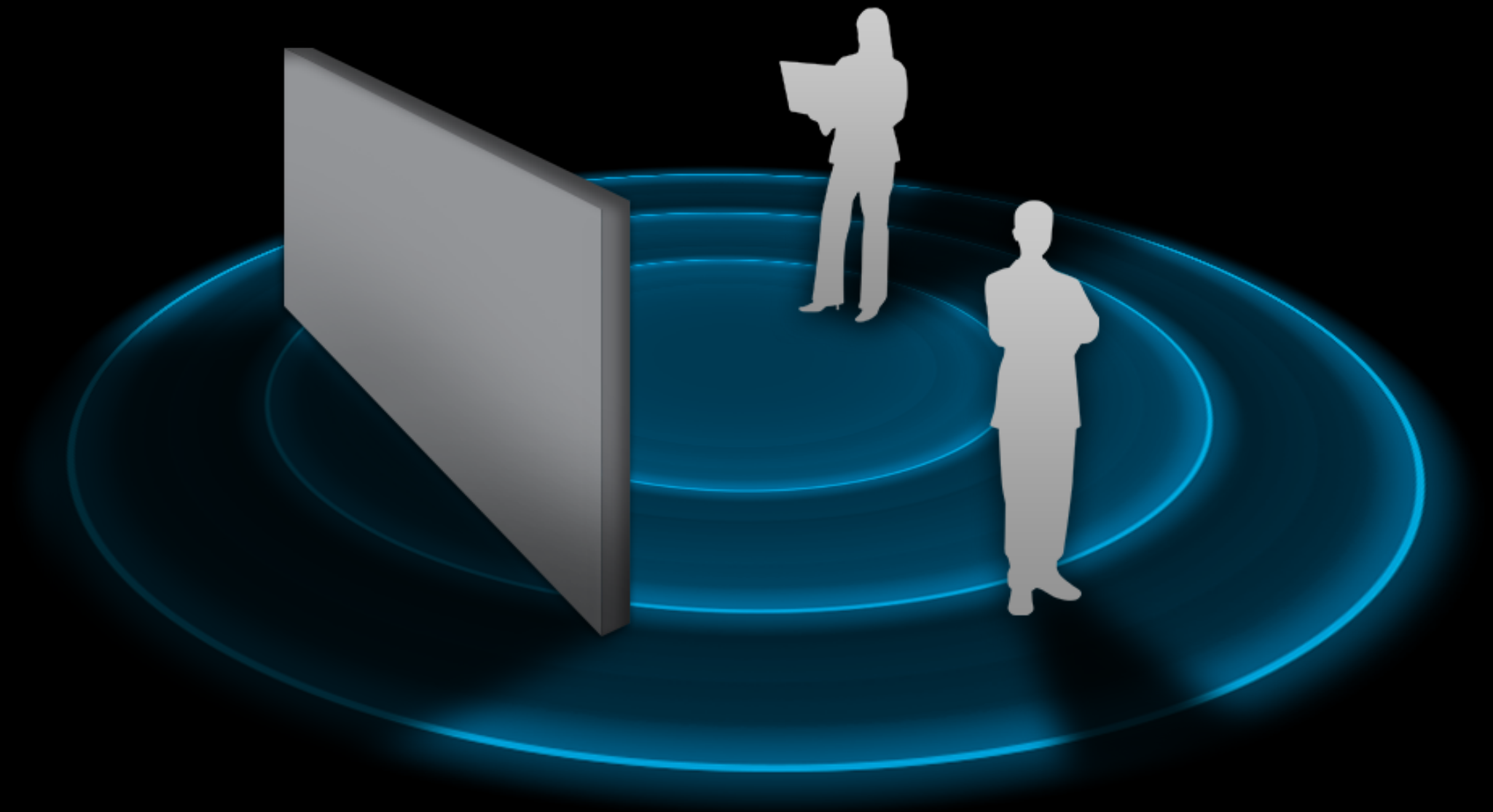
Signal Attenuation

- Bluetooth uses 2.4 GHz



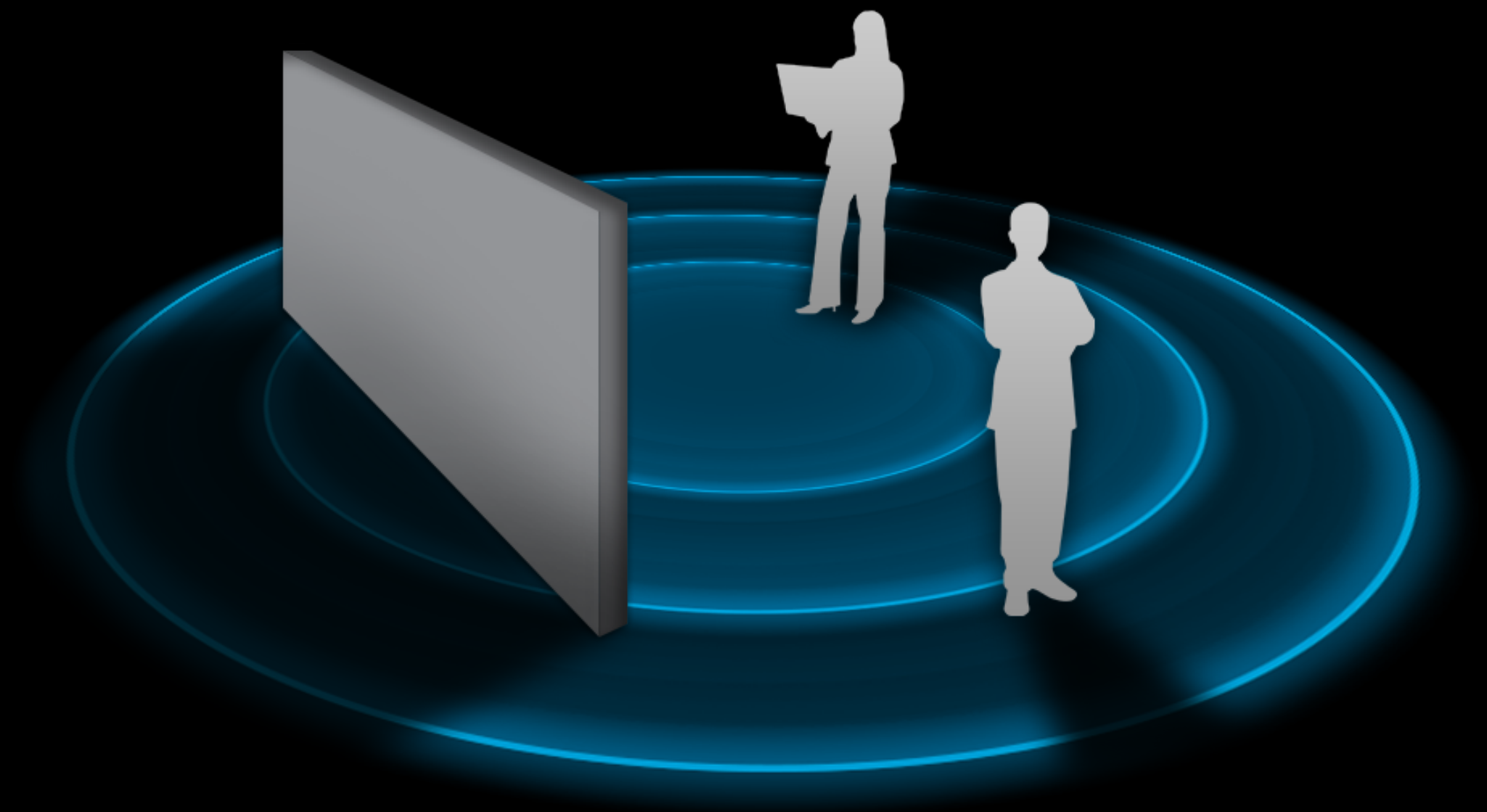
Signal Attenuation

- Bluetooth uses 2.4 GHz
- Walls, doors, etc affect signal strength



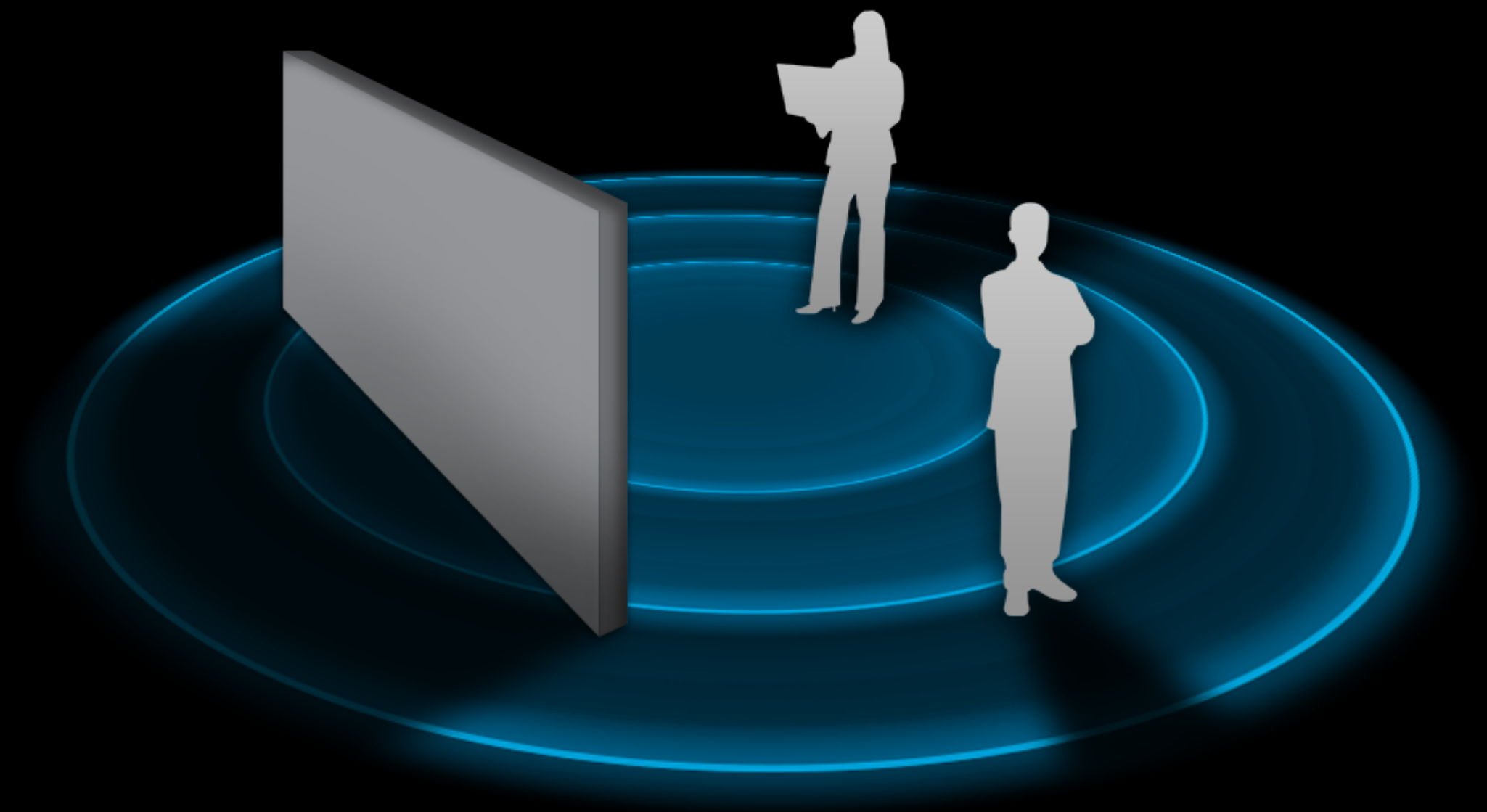
Signal Attenuation

- Bluetooth uses 2.4 GHz
- Walls, doors, etc affect signal strength
- Human body also blocks signals
 - Device in pocket or purse
 - Facing toward or away from beacon



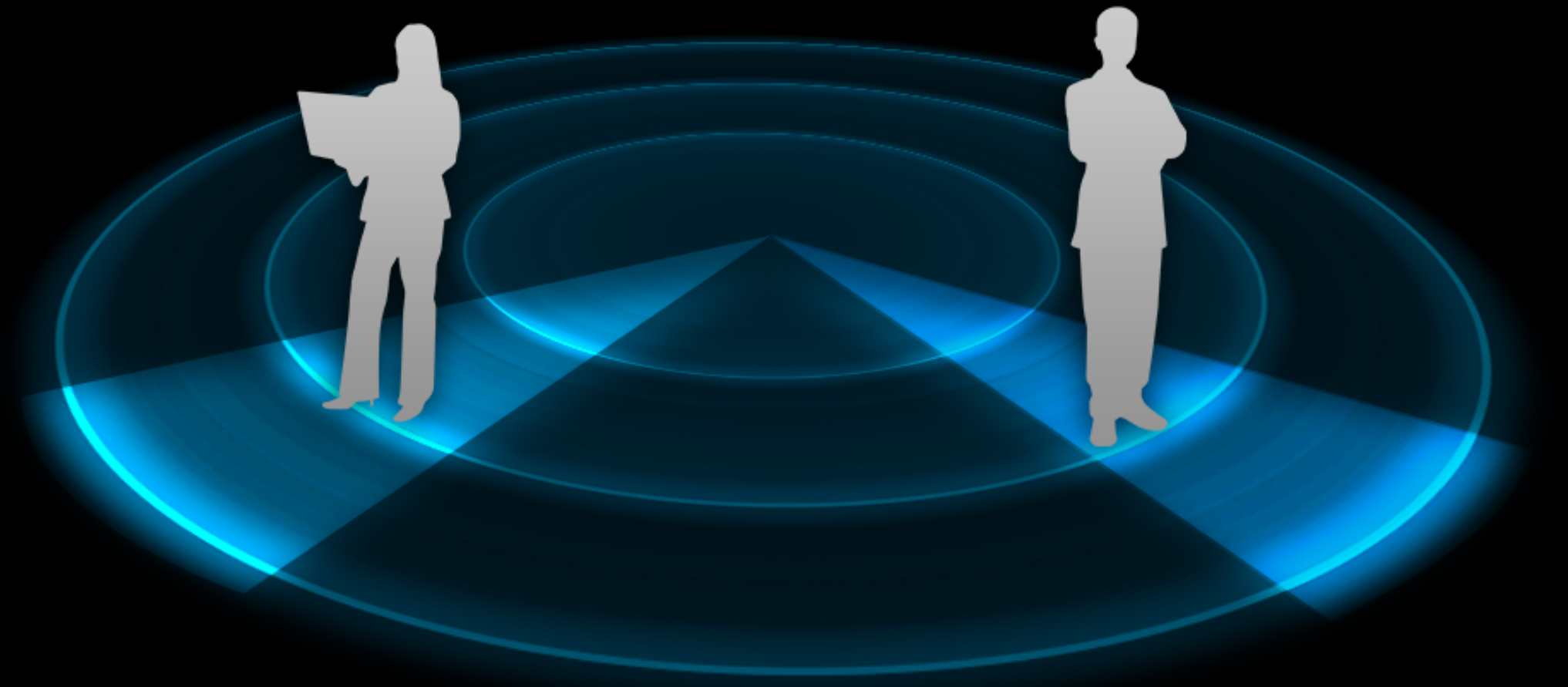
Signal Attenuation

- Bluetooth uses 2.4 GHz
- Walls, doors, etc affect signal strength
- Human body also blocks signals
 - Device in pocket or purse
 - Facing toward or away from beacon
- May cause ranging to indicate Far
 - Even if physically close to beacon



iBeacon Ranging

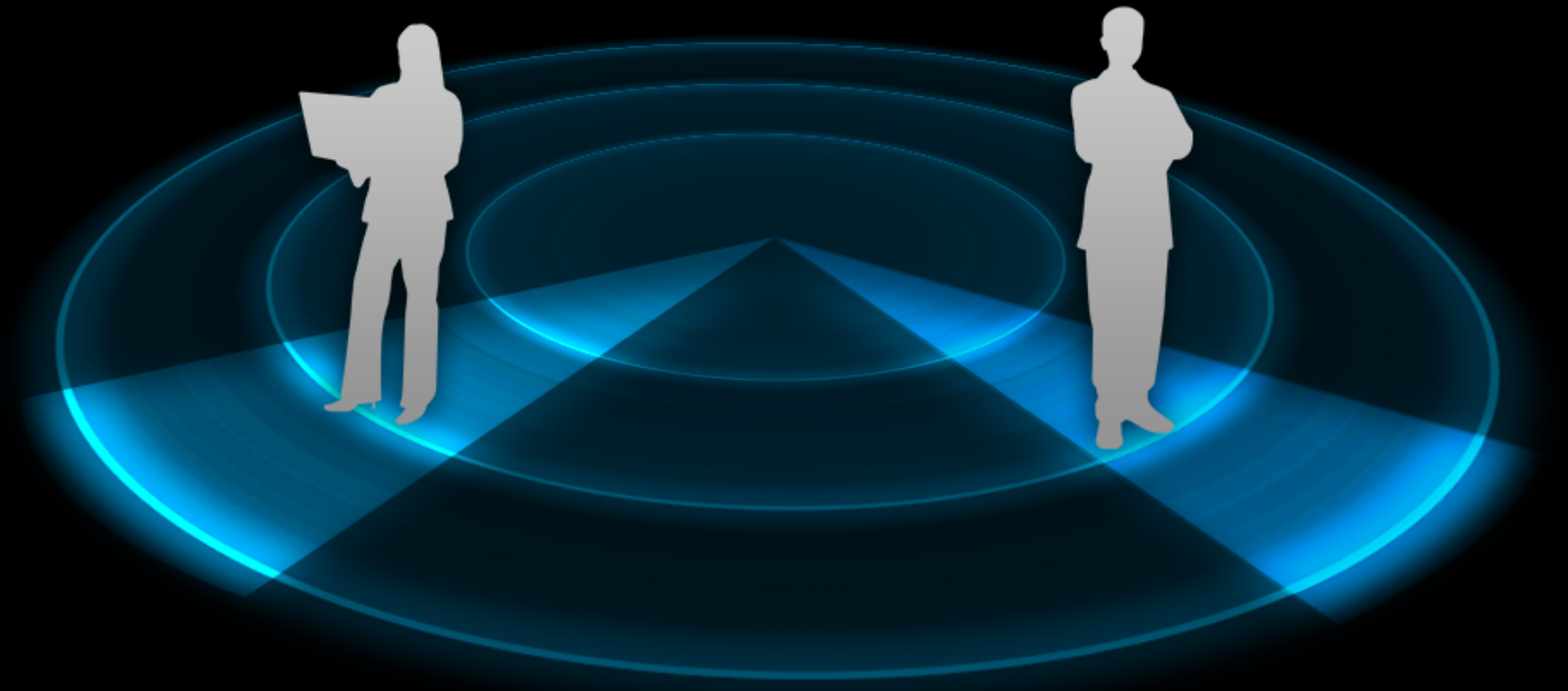
Best Practices



iBeacon Ranging

Best Practices

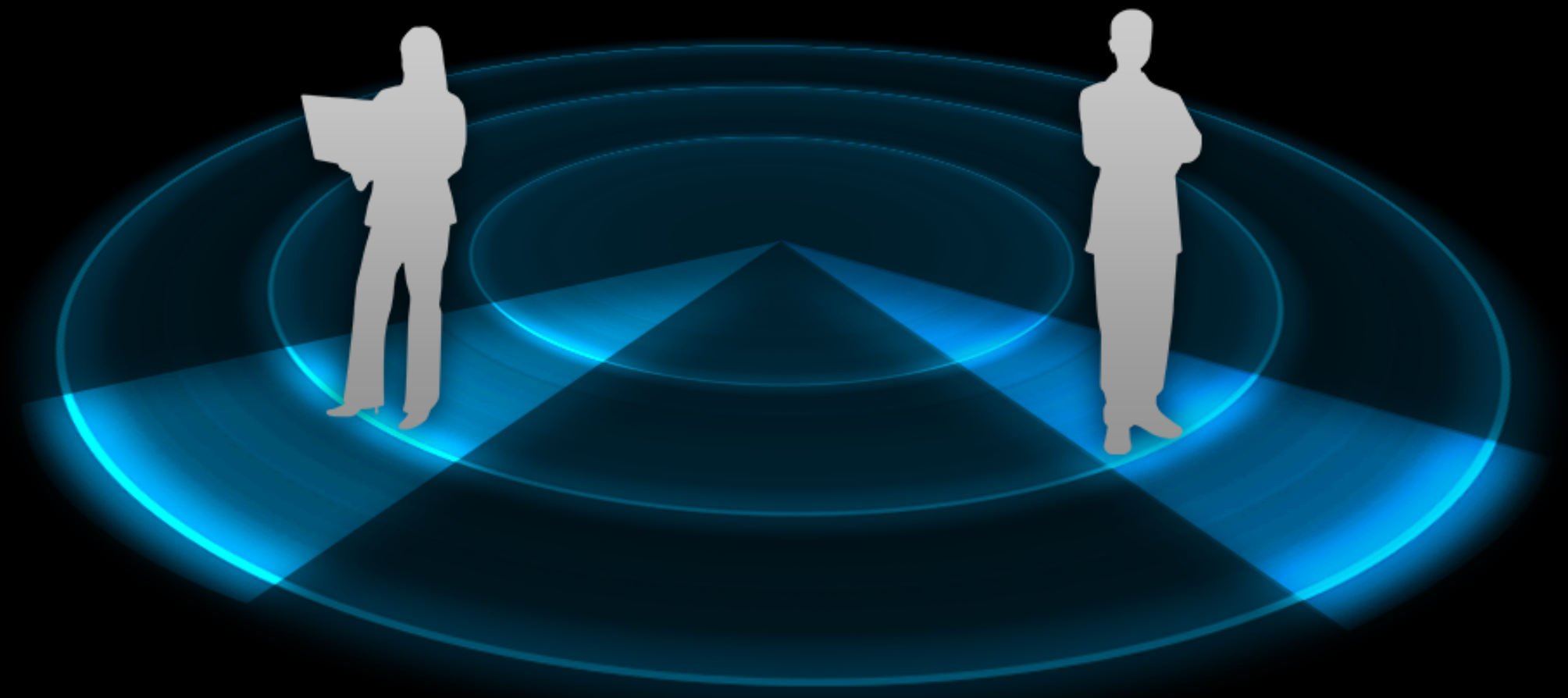
- Intended to be used interactively
 - User should have app frontmost and device in hand



iBeacon Ranging

Best Practices

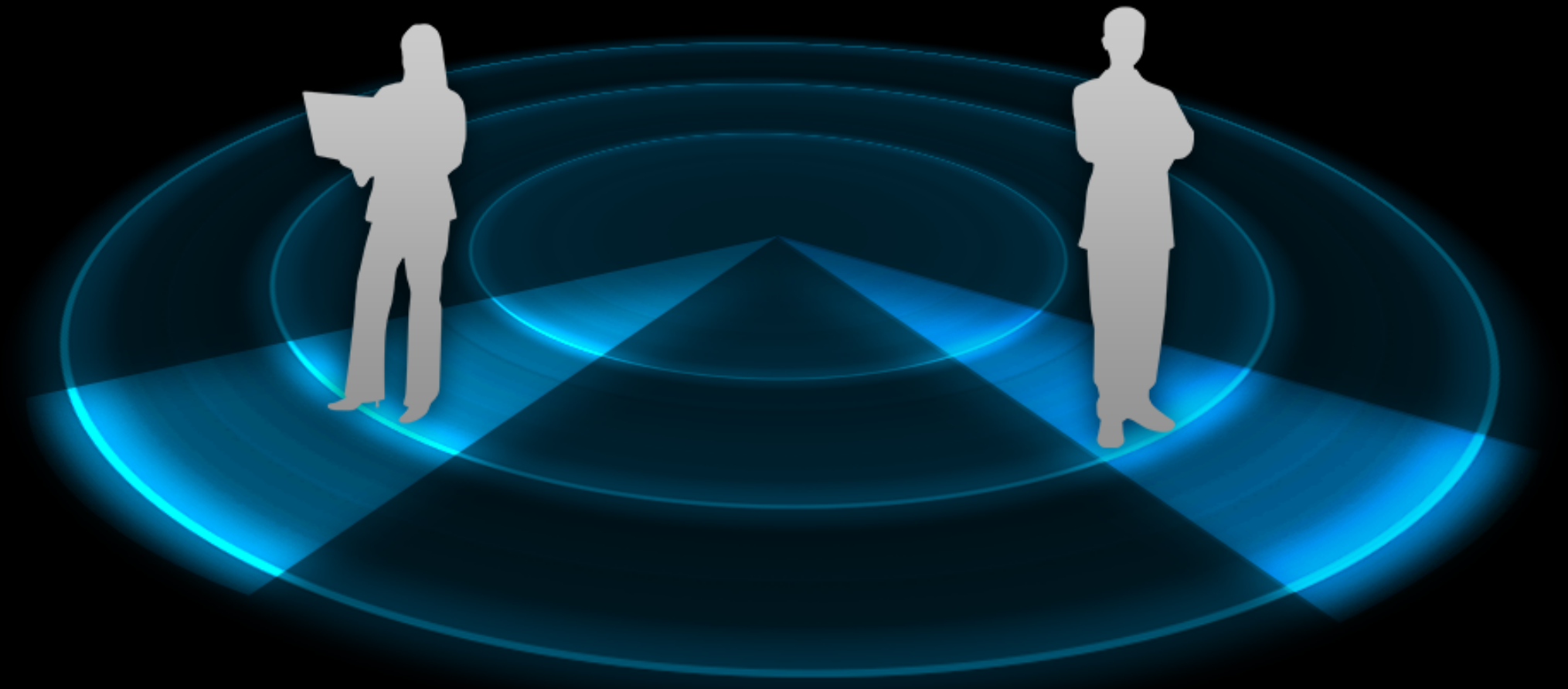
- Intended to be used interactively
 - User should have app frontmost and device in hand
- Best results with line-of-sight to a beacon



iBeacon Ranging

Best Practices

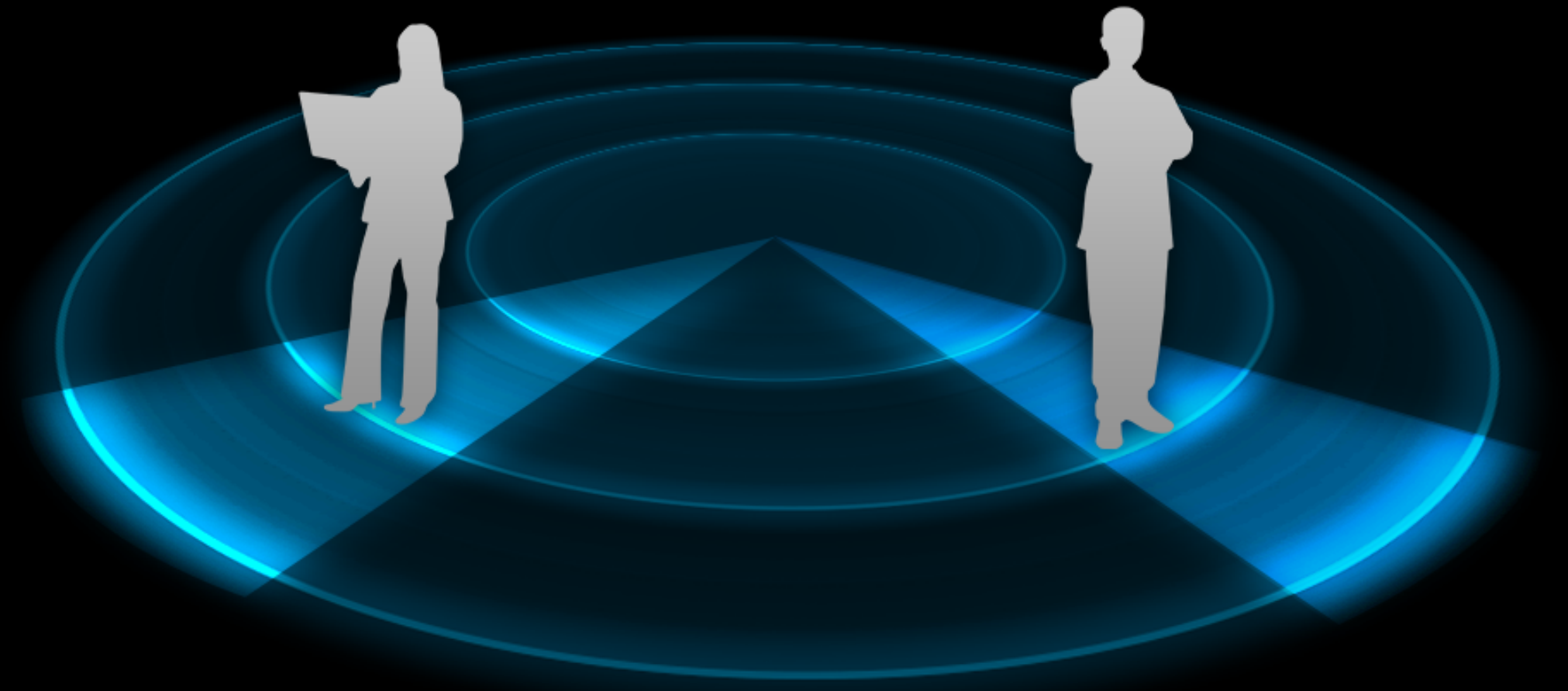
- Intended to be used interactively
 - User should have app frontmost and device in hand
- Best results with line-of-sight to a beacon
- Beacons sorted by estimated proximity



iBeacon Ranging

Best Practices

- Intended to be used interactively
 - User should have app frontmost and device in hand
- Best results with line-of-sight to a beacon
- Beacons sorted by estimated proximity
- Be flexible with Far proximity
 - Consider accuracy carefully



iBeacon Ranging

Calibration

iBeacon Ranging

Calibration

- Crucial to calibrate in deployment environment
 - Consider materials, placement, etc
 - Test with expected number of people

iBeacon Ranging

Calibration

- Crucial to calibrate in deployment environment
 - Consider materials, placement, etc
 - Test with expected number of people
- See what proximity results are like
 - Deploy more beacons if needed

iBeacon

iOS devices



iBeacon

iOS devices

- BLE-enabled iOS devices



iBeacon

iOS devices

- BLE-enabled iOS devices
- Configure as iBeacon



iBeacon

iOS devices

- BLE-enabled iOS devices
- Configure as iBeacon
- Examples
 - Point of Sale iPad
 - iPhone mounted in taxis
 - Museum kiosks



iBeacon

iOS devices

- BLE-enabled iOS devices
- Configure as iBeacon
- Examples
 - Point of Sale iPad
 - iPhone mounted in taxis
 - Museum kiosks
- App must be frontmost and active



iBeacon

Recap

iBeacon

Recap

- Bluetooth region monitoring and proximity detection

iBeacon

Recap

- Bluetooth region monitoring and proximity detection
- Great for mobile objects and indoor uses

iBeacon

Recap

- Bluetooth region monitoring and proximity detection
- Great for mobile objects and indoor uses
- Consider accuracy when using ranging

iBeacon

Recap

- Bluetooth region monitoring and proximity detection
- Great for mobile objects and indoor uses
- Consider accuracy when using ranging
- Calibrate and test in real world scenarios

Agenda

Background Transfers

Multitasking

iBeacon

More Information

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Documentation

<https://developer.apple.com/library/ios>

Apple Developer Forums

<https://devforums.apple.com>

Related Sessions

What's New in Foundation Networking	Core OS Session 705	
What's New with Multitasking	Core OS Session 705	
What's New in Core Location	Services Session 307	
Harnessing iOS to Create Magic in Your Apps	Services Session 310	

